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ABSTRACT

This publication for educators offers in-depth articles on anthropological research, teaching activities, reviews of new resources, and summer fieldwork opportunities. The document aims to disseminate recent research in anthropology; to help those teaching anthropology utilize new materials, approaches, and community resources, as well as integrate anthropology into a variety of curriculum subjects; and to create a national network of anthropologists, archaeologists, teachers, and other professionals interested in disseminating anthropology, particularly in schools. Articles in the newsletter include: "Human Origins: One Man's Search for the Causes in Time" (Ruth Osterweis Selig); and "Urban Community Field Research Project" (JoAnne Lanouette). (BT)

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AnthroNotes:

Museum of Natural History

Publication for Educators, 1999 -2000

P. Ann Kaupp, Ed.

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ANTHRONOTES

MUSEUM OF NATURAL HISTORY PUBLICATION FOR EDUCATORS

VOLUME 22 NO. 1 SPRING/SUMMER 1999

HUMAN ORIGINS: ONE MAN'S SEARCH FOR THE CAUSES IN TIME

by Ruth Osterweis Selig

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"Alan Walker once said to me, 'It does not matter how much you can convince yourself; it only matters how much you can convince your skeptics'— that is science in a nutshell." Rick Potts, interview, 4/2/99.

Of all the animal species on earth, only humans ask from whence they came. Paleoanthropologists strive to answer the what, the why and the how of that remarkable journey. In a recent article, "Why Are We Human?," Rick Potts, director of the Smithsonian's Human Origins Program, summarized the state of current knowledge:

> Due to the rapid pace of discovery, scientists now have fossils from more than 5,000 individuals as far back as 5 million years. That record offers strong evidence that we evolved from apelike species in Africa, and genetic evidence confirms that our closest biological cousins are the African chimpanzees. Scientists from many different fields agree that humans and chimpanzees evolved from a common ancestor that lived between 5 million and 8 million years ago (1999a:1).

Today we know that as many as 12 to 15 different human-like species evolved in the past. Why did some continue and change while most died out? It is this question that has consumed Rick Potts' life, beginning when he was a ninth grader in suburban Philadelphia's Abington High School. The story of Potts' determination to answer this question reveals much about human evolution and paleoanthropology, but it also offers insight into one scientist's single-minded passion and the development of a new theory—"variability selection"—to explain the why and the how of human origins. This article presents three intertwined stories:

- the development of one paleoanthropologist's career;
- the development of the human species through time; and
- the development of a new theory of human evolution: variability selection.

These three stories illuminate the inextricable nature of scientific advances, human knowledge, and the individual scientist. In addition, the story of Rick Potts underscores the interplay between inherent disposition and environmental influence, no small irony for a scientist whose theory of human evolution focuses on the interplay between the environment and the human lineage's evolving predisposition toward adaptability, diversity, and versatility. The necessity to understand time both as personal time during which an individual life unfolds and as geologic time within which the human lineage evolved is another theme running through the three stories.

INSIDE: URBAN COMMUNITY PROJECT ■ AINU EXHIBIT ■ TEACHER RESOURCES

The Early Years

In a recent interview, Potts traced his earliest interest in origins to playground discussions with his older brother, today a mathematician. Potts' awareness of a passion for human origins became evident during a 9th grade world civilization class: "When I left 9th grade, I knew I would become an anthropologist and that I would spend my life studying human origins in East Africa. I went to sleep at night dreaming of doing just that." That 9th grade year Potts asked his parents, neither of whom had gone to college, to buy him two books: Desmond Morris' *The Naked Ape* and Robert Ardrey's *African Genesis*. He still remembers devouring the sections on animal behavior.

"By the end of 9th grade I was completely hooked; then, in the 11th grade, I took a half year anthropology course." His brother was studying anthropology at college, and they shared books and ideas. A history and a biology teacher supported Potts' ambitions. "My history teacher shared my passion for understanding time, and we talked many times about the differences between individual and geological time." She invited Potts to take the AP exam even though his parents could not afford the cost (she paid for the exam) and he was not even in the AP history class. That experience and the encouragement of his biology teacher made a deep impression on Potts. By the end of 12th grade, in 1971, Potts chose a local university, Temple, to study anthropology and pursue his goal of studying human origins in East Africa.

The Environment

Karl Butzer had published his ground breaking *Environment and Archaeology: An Ecological Approach to Prehistory* that same year. Potts' first anthropology professor at Temple believed the study of the human past could not be separated from the study of ancient ecology and assigned all his students to read Butzer. In his first two years, Potts immersed himself in biological studies, focusing on natural selection and adaptation. He took courses in cognitive sciences and physiology, fascinated by the connection between brain physiology and behavior, realizing there was no way to separate the study of physical from cultural evolution. His senior thesis on stone tools argued that tools carry information not only about human capacity for technology but also about general human behavior. Comparing stone tools

RICK'S PASSION FOR THE STUDY OF HUMAN ORIGINS BEGAN IN NINTH GRADE....

of successive hominid species meant comparing cultural and behavioral differences among species. All this seems familiar today, but in the early 1970s studies of stone tools usually meant statistical studies describing various types of technologies, with no reference to such larger issues of behavior or culture.

Graduate School

Potts went straight into graduate school, choosing Harvard primarily because several of its professors called him for interviews ("I felt as if I was a sport's team recruit; I had not heard much about Harvard given my humble roots, but I was impressed by their interest in me.") Neanderthal specialist Erik Trinkaus, then a young assistant professor, read Potts' application, commenting that "he seemed all over the place." A year later Trinkaus remembered his comment and told him: "Now I understand you want to focus on only one thing, but you want to take everything into account to do it."

Paleoanthropologist Alan Walker, then also teaching at Harvard, became a mentor. Most importantly, he arranged for Potts to do his Ph.D. research on Olduvai Gorge, gaining Mary Leakey's blessing for the work. Thus began the last phase in Potts' journey to become a paleoanthropologist—working in the field. First he was to travel to France to gain experience at several

archaeological excavations, then to East Africa to work both at Olduvai Gorge in Tanzania and at the Kenya National Museum in Nairobi, Kenya, to work on the materials previously excavated by Mary and Louis Leakey at Olduvai Gorge. Rick Potts was 23 years old, it was 1976, and he was about to live out his boyhood dream.

Potts explained that in the 1960s and even the 1970s, the study of human origins was still about finding fossil bones and analyzing stone tools, particularly for the early Plio-Pleistocene period of 1.5 to 2.5 million years ago. Researchers were not yet really concerned about behavior or landscapes. "It was a wonderful time for me to be starting out, with my growing interests in ecology, behavior and natural selection."

The Evolution of Early Humans

The context for understanding Potts' research activities over the next two decades is the story of human evolution, a story he has recounted in several popular accounts of the process that transformed a 5-million-year-old tropical ape into a human species of worldwide influence (1999a). Distinctively human qualities emerged over a period of about 5 million years rather than all at once.

As Potts explains the dramatic story, walking regularly on two legs (bipedalism) was the first big step, forever altering the way our ancestors interacted with their environment. By 4 million years ago, apelike individuals (the australopithecines) had evolved who were bipedal but retained an ability to climb trees. Their brains were about one-third the size of a modern human's, they weighed between 60 to 108 pounds, and their height ranged from 3.5 to 5 feet tall.

Either among the australopithecines or the earliest members of our own genus *Homo*, stone toolmaking began to be common by about 2.5 million years ago. The earliest fossils of *Homo* are at least 2.3 to 2.5 million years old, a time period that also sees an increase in cranial or brain capacity. By 1.9 million years ago, the species *H. erectus* had reached modern human size and body proportions and was fully committed to bipedal walking. *H. erectus* was the first hominid to leave Africa, spreading to Asia by about 1.6 million years ago. *H. erectus*' brain size, however, was not fully human, on average only about two-thirds to three-fourths that of fossil modern humans. The relationship of *H. erectus* to the various species before it is still hotly debated. How later fossil humans with modern brain size are related to ourselves is also controversial, particularly in the case of the Neanderthals. (For more information on these current controversies, see Brooks, 1998a,b.)

Only after the brain had reached modern size do we see the complex behaviors we associate with being human: art, clothing, complex stone technology, symbolic representation, and religious behaviors such as burial. These emerged only within the past 100,000 years. Although there is no complete agreement among scientists to explain the emergence of fully modern humans, it is agreed that our species, modern *H. sapiens*, has been the only human species on Earth for at least the last 25,000 years. It is only within the past 10,000 years that farming and herding, cities, writing, trade and warfare arose.

As should be clear from this brief synopsis, humanity's features emerged over time; there was no single threshold or step when humans originated.

Olduvai Gorge

It was to examine early stone tool development that Potts traveled to East Africa to do the research for his Ph.D. In 1977 he arrived in Nairobi, Kenya to re-analyze the fossil bones and stone tools discovered and described by the Leakeys, as well as to analyze other data from Bed I of Olduvai Gorge. It was Mary and Louis Leakey's work at Olduvai Gorge (1936-1985) that had helped shape scientific and popular ideas about the earliest origins of human behavior. It was they who tried to identify the maker of the early "Oldowan stone tools" and to clarify early hominid technology and activity at Olduvai Gorge, then considered the world's oldest archaeological site. Today, the Oldowan industry has been dated to at least 2.5 million years at older East African sites and lasts with little change for about 1 million years. To some specialists such as Glynn Isaac, the pivotal question in the archaeology of early humans was to explain "how high density clusters of stone artifacts and animals bones were found together"(1994:8).

New taphonomic studies had begun to document the processes by which fossil bones and associated stone artifacts were deposited, damaged, and buried over time. Processes such as water transport or feeding by

carnivores could alter what archaeologists found millions of years later and, therefore, could influence archaeological inferences about hominid activity. Potts and his colleague Pat Shipman conducted a groundbreaking study on bones from Olduvai Gorge using the scanning electron microscope, comparing marks on fossil bones with marks produced by known causes (such as carnivore activity or damage from excavation) on modern bones. In the journal *Nature* Potts published his first major scientific paper, describing how stone tool marks could be distinguished from damage to bones made by carnivores and other taphonomic processes. With a clearer understanding of human and carnivore tooth marks, Potts now had a way of seeing how early human toolmakers and carnivores had overlapped or interacted (1981). He concentrated on the hominids' ability to make and transport tools over long distances, freeing them from the apes' "eat as you go" survival strategy. The hominids' transporting tools and food to a single place was a critical transition to creating single places of rest, later known as "home base campsites."

Potts' first book, *Early Hominid Activities at Olduvai* (1988), summarizes his detailed re-analysis of Olduvai hominid behavior that explained site formation. Four levels of analysis are detailed: How did the site form? What did humans do there? How did the different sites at Olduvai reflect different activity patterns in space? How did the hominids' activities change through time?

In the late 1970s, while Potts was preparing his Ph.D. dissertation, Glynn Isaac published his influential articles describing home base sites, places where hominids apparently gathered together over one million years ago to share food and tools (1978). Other anthropologists had been studying home base behavior among modern hunters and gatherers, and Isaac proposed an analogy between these societies and the early hominid ancestors. In his dissertation, Potts used studies of taphonomy, water transport, and landscape analysis to challenge Isaac's view. Contrary to Isaac, Potts concluded that the Olduvai sites did not represent home bases; instead, the earliest hominid sites at Olduvai came before home base development. Based on his re-evaluation of the Oldowan material, Potts asserted that hominids collected stone materials and parts of animal carcasses, obtained through scavenging and hunting, and left them at specified locations, so-called "stone caches," for future processing. In fact, carnivores like leopards and hyenas, attracted to the carcass remains, would have prevented the use of these sites by hominids as the places of primary social activity implied by the home base theory. Potts called his hypothesis "resource transport" (1984, 1991). It was a major theoretical breakthrough, made before he had his Ph.D. in hand, and it was well received by older colleagues in the field, including Isaac.

In 1983 Potts, then an assistant professor of anthropology at Yale University, returned to Africa, this time to direct paleontological/archaeological excavations

at Lainymok, Kenya. Mary Leakey traveled down to visit Potts' excavation, and, impressed with his work, she suggested he turn his attention to the much larger area of Olorgesailie (Oh-lorg-eh-SIGH-lee). The following year Potts gained permission from Richard Leakey, Director of the National Museums in Kenya, to work long-term at Olorgesailie. By 1985 the Smithsonian's National Museum of Natural History had hired Potts to start a new Human Origins Program at the Institution. Within a year, he wrote the first of many grant proposals to fund large-scale excavations at Olorgesailie. Potts' career was launched.

Olorgesailie

For an aspiring paleoanthropologist, Olduvai Gorge was a dream come true, but it was Olorgesailie that changed Potts' life. In the beginning he was after bones and tools and the opportunity to test some ideas regarding home bases by enlarging the context of hominid behavior. To do this work, Potts began to develop a landscape-scale approach to the excavation and study of hominid tools, animals bones and the overall environment. At a single level, 990,000 years old, Potts' team excavated many sites including a huge elephant butchery site. For several summers Potts' team worked to reconstruct the life ways and environmental context of *H. erectus*, 1 million to 600,000 years ago. Potts differentiated his approach from fossil collecting; he was searching to understand the ecological niche of early humans by focusing on excavating an entire landscape, not just surface collecting across the land or putting another fossil onto the family tree.

Soon, however, Potts had begun to ask new questions regarding space and time. What was the ecology of the region through time? What habitats did the various hominids living there have to cope with over a million years in time? With the new dates available at Olorgesailie, Potts realized he could document an entire sequence from 1.2 million up to 49,000 years ago. It was, he said, "an archive of environments, a textbook of hominid behavior...the Rift Valley writ large through time." To analyze and assess this remarkable "archive through time," Potts again assembled an international team to excavate and synthesize the complex data. Potts has always stressed a team approach, working with "geologists, archaeologists, paleontologists, environmental scientists, and a great group of well-trained Kenyan excavators."

Environmental Oscillation

By the early 1990s environmental issues had come to the forefront of public attention and scientific concern, resulting in new research and multiple techniques to measure environments. Potts adapted these techniques to understanding past climates, environments, soils, and vegetation—applying many of these new techniques to his amazing "slice through time." (1998a: 96-104). What he found was startling. The dating and stratigraphic analysis at Olorgesailie uncovered a widening variability through time. Furthermore, Olorgesailie was the tantalizing lead-in to an examination of the larger global picture of environmental change. Looking at the incontrovertible evidence from soils, vegetation, and lake sediments worldwide, Potts could no longer avoid the key word: oscillation.

By 1992 Potts had become committed to understanding the impact of environmental change on early hominids. Much of that year Potts spent walking up and down the hillsides of the site. "I could walk up a hillside and see the bands of the blinding white sediments of the lake replaced by grey and brown soils followed by the thin salt layer indicating the lake had dried up. But then a little further forward in time, the lake would be back. You walk up and down and the oscillation of the environment becomes unmistakable, and you realize that that was the challenge to the hominids, the oscillation of the environment." But how did that challenge operate?

East African Mammal Study

In 1992 Potts thought constantly about the extreme environmental variability he saw as the crucible through which the human lineage had passed. He kept asking himself where had all our human versatility and diversity come from; and if and why humans had evolved differently from other animals, whose evolution he had studied for years. "If natural selection is going to hone an organism's characteristics to the specific environment in which it lives, then how do you transform a small population of apelike hominids into a species of world-wide influence, diverse and extremely flexible in their

behavior. That is the critical ecological question of human evolution."

Understanding the adaptive challenges for other East African mammals might be a key. As Potts explains, with humans we have no comparison, we have the unique situation of human evolution, and our only comparison is with earlier hominids who did not survive. So Potts turned to a study of large mammals in Africa, re-analyzing the fossil animals from Lainymok, a large and diverse sample ideal for such a study. Together Olorgesailie and Lainymok span the time period during which modern human brain size developed—a critical time period for human evolution. Potts and a colleague Alan Deino published their analysis documenting the extinction of an entire group of mammals during this period, around 400,000 years ago (1995). They hypothesized that large numbers of mammals became extinct as a response to rapid climatic fluctuations and extreme dietary specialization. As the mammals eating coarse, low-lying vegetation became extinct, smaller, more versatile, and more generalized eaters emerged; these are the large mammal species still with us today. Potts wondered if the human lineage had gone through a similar pattern of extinction and adaptation as a response to extreme environmental change.

A New Book

In 1990 Potts had signed a contract with William Morrow publishers to write a book dealing with Olorgesailie and environmental change. He wrote half the book and then in 1992 realized his entire thinking was shifting. "I had a series of brainstorms at night, wondering if and how environmental oscillation had been the major influence on the developing human lineage. I realized I had to start the book over again. I called my editors, told them I was throwing out everything I had written, but I promised to start over. I knew I was onto something big, and that it would take time to work out the details. All the training I had in college and graduate school, all the early conversations I had with my brother, all my reading of Charles Darwin flooded back. I knew I had to deal with the question of environmental variability and its impact as a major selective factor explaining human evolution."

Potts realized immediately he would have to challenge one of the major theories and assumptions of human evolution: the transition in Africa from widespread forests to widespread savanna grasslands as the major explanatory factor for the emergence of bipedal, tool using human beings. In his new book, *Humanity's Descent* (1996a), he proposed instead a new theory of environmental variability as the key selective factor explaining the emergence of the human species.

The Savannah Hypothesis

According to conventional wisdom, our earliest ancestors were forced to adapt to a new, drier savannah environment that replaced a once heavily forested landscape. Bipedal walking developed as a favored adaptation to the ground, with hominids using their newly freed hands to make and use tools, especially for hunting. This led to the eating of meat and increased sources of protein that fueled a larger brain. Eventually food sharing, home base living, social interaction, and division of labor by sex emerged. The savannah hypothesis, which Potts was originally taught, had made a lot of sense, but it didn't fit the environmental fluctuations that he had documented. Over the short run some hominids may have adapted to specific environments including the savannah, but over the millennia of time, the human lineage had to accommodate to and cope with huge oscillations or swings in the environment that were manifested all over the world (1998a:109-112).

Variability Selection

It was this variability that Potts identified as the key to the three distinctive breakthroughs of human evolution: bipedal walking (4-1.9 million years ago); stone tool making (2.5 million–1.5 million years ago); and increased brain size (between 700,000 to 150,000 years ago)—each coinciding with increased environmental oscillation. There was a larger amount of savannah in certain areas of the world, but increased fluctuation was just as much a hallmark of global climate and much more influential on the course of human evolution. Potts called his new theory "variability selection," a process that links adaptive change to large degrees of environmental variability. The theory refers to variability as a selection agency, not to the variability or versatility that developed in the human population.

As Potts explains, variability selection "is, in essence, a hypothesis about how hominid evolution has been a response to environments and environmental change."

After years of reconstructing environmental variability, as well as the evolution and extinction of mammal species, Potts realized that survival of a versatile species capable of adjusting to novel surroundings was the story of human evolution. As environmental conditions drastically fluctuated, the evolutionary winners were populations that evolved a capacity to respond in new ways to diverse habitats. This process—variability selection—favors genes that improve an organism's adaptability, and the theory explains why our particular pattern of human evolution occurred. As Potts says, " it is not the whole explanation, but I believe it is a critical piece."

Variability selection is also a theory that Potts knows modifies one of the tenets of Darwinian evolution: long-term directional consistency in selection over time, consistency implied, for example, in the savannah hypothesis. In a 1996 article in *Science*, Potts explains the significance of his theory to understanding human evolution: "Hardly just noise, long-term fluctuation was a signal of potentially major evolutionary consequence. I have proposed the term *variability selection* to describe the effects of repeated, dramatic shifting in Darwinian selection over time. This inconsistency over many generations may have had an important impact on hominid evolution" (1996b:922).

Natural Selection

As Potts explains in a recent article: "Natural Selection is the process by which adaptive structures are evolved and maintained. As a result of this century's union of population biology, genetics, and paleontology (the neo-Darwinian synthesis), natural selection is regarded as the main cause of change in organisms in relation to their surroundings"(1998b:81). Traditionally, this meant consistency of adaptation over time. "Selective consistency, or long-term uniform selection pressure, is largely assumed to be the way by which adaptive complexity evolves" (1998b:81). But the adaptive conditions of hominid evolution over time, according to Potts' research, were highly inconsistent on a local to global scale.

Potts' theory posits that inconsistency of environmental conditions had critical implications for hominid evolution. There are several ways organisms can respond to habitat fluctuation (1998b:84-85). The first is simply to follow the preferred environment, an

adaptive pattern that works for a while, but can lead to extinction when large environmental fluctuations occur. The second is to broaden the range of conditions under which an organism can live. This can be achieved by both genetic polymorphism (several different genetic potentials existing within the same population) or by phenotypic plasticity, when organisms can respond differently at any given time with the same genotypic inheritance.

A third avenue of flexibility is "variability selection," or the evolution of adaptive mechanisms within a population which "assist an organism's sophisticated intake of and responsiveness to environmental data" (1998b:85). Examples of such adaptive mechanisms might be new locomotor systems (such as bipedalism) and an enlarged brain to process and generate complex cognitive responses. In light of Potts' theory, the evolution of the brain takes on new meaning, as it is our brain that enables us to adapt to changing conditions, novel problems, and multiple solutions. Climatic oscillation becomes more intense after 700,000 years ago and it is from this time to about 150,000 years ago that the human brain reaches modern size. Potts has stated that his theory requires that we may have to "significantly revise the way natural selection is construed to have operated—not merely as *selection pressure* or as *adaptation to* a model environment, but as

a response to habitat and resource variability from place to place and over time" (1994:23).

Potts points out that in each epoch of human evolution, there were species that evolved as specialists, that adapted to a specific environment and lived alongside more versatile forms that survived after the more specialized forms became extinct. Two examples he cites are the robust australopithecines and the cold-weather adapted Neanderthals, both highly specialized hominids that became extinct. The eventual survival of a single versatile lineage, extraordinarily diverse in its behavior and spread worldwide, may well have evolved as the result of adaptation to our planet's variable environment.

Nature and Humankind

The relationship of nature and humankind is one of the recurring and most thought provoking themes of Potts' popular and extremely well-written volume, *Humanity's Descent* (1996a). "It is important to get the relationship between Nature and humankind right, both in its long-term development and in its present possibility"(44). Potts explains that humans' penchant for setting themselves apart from Nature stems from an illusory divide into natural and human domains...a divide that has "never existed over the long course of human presence on Earth" (267). The implications of this key insight have profound public policy ramifications, for, as Potts says, "the world now rests...on the legacy left by a single species" (44). The fact that our essential human qualities emerged as the result of our ecological relationship to Nature contrasts with the ironic observation that our resulting dominion today could disrupt forever the ecological balance on Earth.

Conclusion

Science moves forward by the process of hypothesis testing, development of new theories, unearthing new data, and proposing alternative explanations. In science, the development of a major new hypothesis or theory is always extraordinary in its originality, but it is, nonetheless, also a beginning; colleagues will test such new ideas with their own data and their own understanding. For Potts, Olorgesailie was the inspiration, environmental change the key to the development of a major new theory to explain human evolution. Variability selection is a dramatic insight and a theory that others now must take into account in their attempt to explain the human past. Potts and his fellow paleoanthropologists will develop other insights, and modifications of Potts' theory of variability selection will inevitably develop through time. But the importance of this new and provocative theory will stand as a major contribution to the ongoing study of human origins.

What Potts' journey demonstrates is that one scientist's approach to understanding the world around him can grow from many seeds: a sharp, fertile mind with a penchant of its own for "the big picture"; an enduring life-long passion to find out where humans came from; and a determination to unravel the whole puzzle, not just a single piece. The influence of teachers, mentors, colleagues, and the scientists who came before, all influenced Potts as he developed through time. Just as his theory connects the development of the human lineage to the millennia of challenging environments, so one can see Potts' life developing from the interaction of his unique mind and driving passion with the influences of his family, teachers, colleagues, and experiences—his environment through time.

Postscript

As this *AnthroNotes* article was being written, Potts flew to London to present his theory of variability selection–at the invitation of the Linnean Society. Potts must have been aware that in July 1858 Charles Darwin and Alfred Wallace, at the urging of the geologist Charles Lyell and the botanist Sir Joseph Hooker, presented simultaneously their papers on evolution through natural selection—to the Linnean Society. On May 24, 1859, Thomas Bell, president of the Society, reported, in his presidential address, that "The year which has passed...has not...been marked by any of those striking discoveries which at once revolutionize, so to speak, the department of science on which they bear" (*1860:* viii). For the impact of variability selection, as with the theory of natural selection, only time will tell.

Further Reading

Authored by Rick Potts (Richard Potts):

1981. "Cutmarks Made by Stone Tools on Bones from Olduvai Gorge, Tanzania," (with Pat Shipman). *Nature* 291: 577-80.

1984. Home Bases and Early Hominids. *American Scientist* 72:338-347.

1988. *Early Hominid Activities at Olduvai*. Aldine de Gruyter.

1989. Ecological Context and Explanations of Hominid Evolution. *Osa* 14: 99-112.

1991. Why the Oldowan? Plio-Pleistocene Toolmaking and the Transport of Resources. *Journal of Anthropological Research* 47(2):153-176.

1994. "Variables versus Models of Early Pleistocene Hominid Land Use." *Journal of Human Evolution* 27: 7-24.

1995. Mid-Pleistocene Change in Large Mammal Faunas of East Africa (with Alan Deino). *Quaternary Research* 43:106-113.

1996a. *Humanity's Descent: The Consequences of Ecological Instability*. William Morrow and Co.

1996b. Evolution and Climate Variability. *Science*. 273: 922-923.

1998a Environmental Hypotheses of Hominin Evolution. *Yearbook of Physical Anthropology* 41: 93-136.

WHY ARE WE HUMAN?

1998b "Variability Selection in Hominid Evolution." *Evolutionary Anthropology* 7:81-96.

1999a Why Are We Human? *The Washington Post*. 4/14/99. *Horizon Section*: 1, 4-5.

1999b Human Evolution, in *Encarta Encyclopedia*. Microsoft Corp. Online Encyclopedia. *Prehistory*. Aldine-Atherton.

Other Publications

Ardrey, Robert. 1961. *African Genesis*. Collins.

Bell, Thomas. 1860. "The Year Which Has Passed." Presidential address to the Linnean Society on the Anniversary of Linnaeus's birth, May 24, 1859 (*Proceedings of the Linnean Society of London*, viii-xx. Bound in *Journal of the Proceedings of The Linnean Society: Botany 4*).

Brooks, Alison S. 1998a. "Modern Human Origins: What's New With What's Old?" Revised and updated article from *AnthroNotes* 14(3), 1992, in *Anthropology Explored: The Best of Smithsonian AnthroNotes*, edited by Ruth Osterweis Selig and Marilyn R. London. Smithsonian Institution Press, 54-65.

Brooks, Alison S. 1998b. "What's New in Early Human Evolution 5 to 1 Million Years Ago?" Revised and updated article from *AnthroNotes* 18(2), 1996, in *Anthropology Explored : The Best of Smithsonian AnthroNotes*, edited by Ruth Osterweis Selig and Marilyn R. London, Smithsonian Institution Press, 38-53.

Butzer, Karl. 1971. *Environment and Archaeology: An Ecological Approach to Prehistory*. Aldine-Atherton.

Isaac, Glynn. 1978. "The Food-Sharing Behavior of Proto-human Hominids." *Scientific American* 238: 90-108.

Morris, Desmond. 1967. *The Naked Ape*. McGraw-Hill.

**For further references, request the bibliography "Human Evolution and Paleoanthropology " from the Anthropology Outreach Office, Smithsonian Institution, Washington, D.C. 20560-0112.

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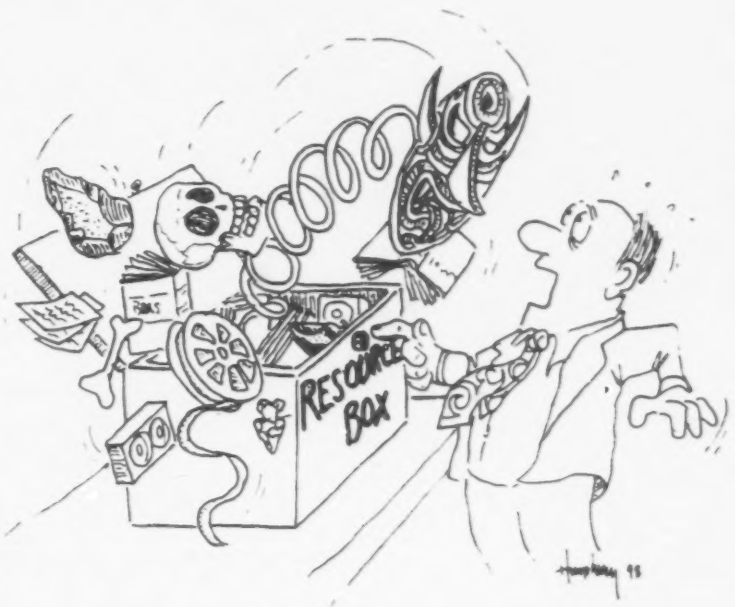
SMITHSONIAN RESOURCES

On the Web:

◆ *Anthropology on the Internet for K-12*, compiled by Margaret Dittemore, Smithsonian Institution Libraries, is an annotated listing of hot links to selected web sites with information for teachers and students about the field of anthropology. The sites fall under the following headings: general resources, careers, archaeology, social/cultural anthropology, physical anthropology, linguistics, area studies, museums, virtual exhibits, electronic publications, and associations. Each section is illustrated with photos of Smithsonian anthropologists and includes information about their particular research activities. Link it to your own web site! Suggestions of sources to add are welcome. http://www.sil.si.edu/SILPublications/Anthropology-K12/



◆ *Annotated Bibliography on American Indians for K-12* (www.nmnh.si.edu/anth/). Click on the Anthropology Outreach Office. The bibliography, compiled by Ann Kaupp, Fiona Burnett, Maureen Malloy, and Cheryl Wilson, describes over 800 books and is organized by culture area and tribe and is further divided into non-fiction and fiction, traditional stories, and biographies. The Introduction explains how the books were evaluated, provides information about stereotypes, and offers further resources.

◆ The Smithsonian Office of Education has available on the web (educate.si.edu) and in hard copy two teaching activities for grades 4-9: "Teaching From Objects and Stories: Learning About the Bering Sea Eskimo People" and "Decoding the Past: The Work of Archaeologists." Also available is the *Smithsonian Resource Guide for Teachers*, a catalog listing materials (many free) from all the Smithsonian Museums and other educational offices. ($5 for hard copy.) Email: education@soe.si.edu

Educational Kits:

The following kits were produced by the Smithsonian's Center For Folklife Programs and Cultural Studies and can be ordered from Smithsonian Folkways Mail Order, 414 Hungerford Dr., Suite 444, Rockville, MD 20850; (301) 443-2314; Fax: (301) 443-1819. Orders only: (800) 410-9815. Email: info@folklife.si.edu. Web site: http://www.si.edu.

Land and Native American Cultures introduces students in grades 9-12 to the use of the land in three case studies: the Hopi of Arizona; the Tlingit, Haida, and Tsimshian of Alaska; and the Aymara and Quechua of Bolivia and Peru. The units address subsistence, crafts, mythology, and ritual. Includes teacher/student guide with narrative, photographs, resource listing, and activity questions. 1997. $35.00. Catalog #SF90011.

Wisconsin Powwow/Naamikaaged: Dancer for the People consists of two video sets showing how powwows incorporate historical traditions and modern innovations. A 40-page booklet with historical background, transcription of the soundtrack, classroom questions, and suggestions for further reading and listening accompanies the videos. This kit is focused for grades 6-12. 1996. $34.95. Catalog #SF48004

Borders and Identity, a bilingual kit for grades 6-12, explores the complex notion of identity along the

U.S./Mexican border and is organized into four segments—history, belief, expressive arts, and occupational traditions. The kit includes a four-part video, poster-size cultural map, and a teacher/ student guide with classroom activities. 1996. $55.00. Catalog #SF90010

Learning about Folklife: The U.S. Virgin Islands & Senegal focuses on foodways, music, storytelling, and celebrations. The kit for grades 6-12 contains a four-part video-cassette, 2 audio-cassettes, and a teacher's guide with maps, photographs, and line illustrations. 1992. $45.00. Catalog #SF90012.

OTHER RESOURCES

On the web:

• Check out these web sites for Anthropology resources and materials: www.serve.com/archaeology; www.nitehawk.com/alleycat/anth-faq.html; www.plattsburgh.edu/ant/Web_Instructors.html (for the teaching of anthropology), and www.si.edu (Smithsonian Institution website).

• Keep up-to-date on the Kennewick Man controversy through Friends of America's Past, a fledgling nonprofit organization dedicated to promoting and advancing the rights of scientists and the public to learn about America's past. Concerned about maintaining the integrity of science, this organization includes two archaeologists, a physical anthropologist and an attorney as its board of directors. Friends of America's Past sponsors public lectures and is now involved in raising funds in support of the Kennewick Man case. Contact: Friends of America's Past, 7410 SW Oleson Rd., Suite 202, Portland, OR 97223; website: (www.friendsofpast.org/).

• The KIDS Report is published biweekly with the support of the Internet Scout Project, the National Science Foundation, and a grant from John and Tashia Morgridge. Produced by K-12 students as a resource for other K-12 students, it is an ongoing, cooperative effort of 12 classrooms from around the United States. Teachers assist and provide support; however, students select, evaluate, and annotate all resources included in every issue of the KIDS Report. Http://scout.cs.wisc.edu/scout/KIDS/selection.html. This issue of the KIDS Report, "Kids Investigating and Discovering Sites," dated April 27, 1999, was written and produced by students at Elmore Elementary School in Green Bay, Wisconsin. Some of the topics included are: "NOVA Online-Ice Mummies," "Odyssey in Egypt," "Old Sturbridge Village," and "The Tomb of the Chihuahua Pharaohs."

Publications:

• *Dig* is the Archaeological Institute of America's new bimonthly magazine for young people. Its first issue (April/May 1999) includes articles on mummies, a new dinosaur named after the boy who found it, the discovery of an Andean mummy girl, plus new archaeological discoveries and projects and games for readers and much more. To subscribe, write to Dig, Subscriptions Services, P.O. Box 469076, Escondido, CA 92046-9076; call toll free: 877-673-7344; or subscription@archaeology.org. Check out their web site at www.dig.archaeology.org.

• For teachers looking for readable, up-to-date articles, *Annual Editions* selects articles previously published in magazines, newspapers, and journals and compiles them into one volume. Anthropology, archaeology, and physical anthropology are among the over 65 volume topics available. The 99/00 volume on Physical Anthropology contains Robert Sussman's article "Exploring Our Basic Human Nature: Are Humans Inherently Violent?" (pp. 201-205), originally published in the Fall 1997 issue of *AnthroNotes*. *Annual Editions* provides teachers with an *Instructor's Resource Guide*. Write to: Annual Editions, Dushkin/ McGraw-Hill, Sluice Dock, Guilford, CT 06437, or call (800) 338-3987; fax (203) 453-6000. Price: $16.84 for single copy.

• *Discovering Archaeology* is a new glossy bimonthly archaeology magazine for the general reader and specialist that covers discoveries in archaeology and archaeological sciences. Check their web site (http://www.discoverarchaeology.com/main/htm), or write Discover Archaeology, PO Box 9473, El Paso, TX 79995, or call toll free at (877) 347-2724.

• The Society of American Archaeology now has a bulletin board on "Teaching Archaeology in the 21st Century" to discuss issues related to teaching archaeology to undergraduates. Visit the SAA website at: http://www.saa.org/Education/ Curriculum/ and join in the national dialogue.

URBAN COMMUNITY FIELD RESEARCH PROJECT

by JoAnne Lanouette

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If students grow up in downtown Cleveland (Ohio), attend Cuyahoga Community College (CCC), and take Mark Lewine's anthropology class, they might join a dig on campus and discover much about the history of their own community, an immigrant starting point at various times for English, Germans, Czechs, Italians, Jews, and for African Americans. But the Urban Community Research Project serves many more than one class. In fact, this five-year pilot program in historical archaeology offers an exciting interdisciplinary collaboration among the CCC and a number of area academic institutions, museums and agencies. It draws students from other local community and four-year colleges, junior and senior high schools, and encourages the involvement of citizen volunteers. More than 500 people have participated since the program began in 1994. The team behind this successful effort includes Dr. Mark Lewine, CCC professor of Anthropology and Sociology; consulting historic archaeologist Al Lee; and Dorothy Salem, historian and professor of Women's Studies and African Studies at CCC.

The first site investigated by the Program was originally a private residential property, now a part of Cuyahoga Community College's Metro campus. Standing for over one hundred years in the shadow of St. Joseph's Roman Catholic Church and Franciscan Monastery, the site was somewhat protected from disturbance. The students' archival and archaeological research, under the supervision of the project's leaders, led to recovering evidence of two identifiable occupations of the site. The earlier occupation, dating between 1825 and 1840, was by as yet unidentified rural villagers who used the site domestically and for cottage industry soap-making. In the mid-1850s the Burkhart family established a residence and wallpaper business on the property. Through the last quarter of the nineteenth century, as Burkhart daughters grew up and married, their husbands' building trades such as tinsmithing, roofing, window-making, carpentry and painting were added to the services offered by the wallpaper business.

Students in the program conducted document research in the archives of the Western Reserve Historical Society, studied maps, and analyzed the remains and contents of cisterns, privies and trash pits recovered archaeologically from the site. The faculty then helped the students integrate the data to help establish the evidence for the social and economic changes that occurred as this outpost of a rural village became a small neighborhood off a large industrialized urban center. Further, the distinctive consumer behavior of the family, who maintained for business reasons a horse and wagon, provides an illuminating

contrast with the more typical "walking city" consumer pattern. Today a parking lot is being built over the site for the CCC's use, but underneath archaeological opportunities still exist.

Current investigations by the Program are at the Long-Severance site, also situated on the metro campus. Student archival research showed that Dr. David Long developed the property in the mid 1840s as a "country estate." Long was a prominent Cleveland physician and merchant. He established his practice and a dry goods store in the village of Cleveland in 1810 and was a central figure in affairs of business, religion, politics, philanthropy and social reform for the next forty years. His descendents, through his daughter Mary Long Severance, have remained prominent in Cleveland business and civic affairs well into the twentieth century.

A major social concern for the Long and Severance families was opposition to slavery. Long and his son-in-law Solomon Severance were founding officers of the Cleveland (1831) and Cuyahoga County (1837) Anti-Slavery Societies. Solomon's brother Theodoric and his wife Caroline were early advocates of a more militant, abolitionist position, and all were later involved in the founding of new Presbyterian churches as old congregations split over the issue. Severance's involvement in African-American affairs continued beyond emancipation; a letter dated 1913 from Booker T. Washington to Louis Severance (Solomon and Mary's son) thanks him for his continued support of Tuskeegee Institute.

Urbanization caught up with the Severance home in the early 1860s, by which time Cleveland was the fastest growing urban center in the nation. A portion of the property was subdivided into small, single-family and commercial lots, and a church occupied the corner of a newly erected street. Gradually the area became a middle class section of the walking city, and then gradually the economic and social standing of the neighborhood declined as the area became more industrial. When the Severances moved from the property in 1899, it was purchased and developed for St. Ann's Infant Asylum and Maternity Hospital, an institution operated by the Roman Catholic Diocese of Cleveland for the aid of unwed mothers. The property was obtained from the corporate descendent of St. Ann's in 1973.

Archaeological research is continuing on the Long/Severance site this spring and summer. The Urban Community Research Project has also established an archaeological laboratory with office and teaching facilities. Recently the Martha Holden Jennings Foundation granted funding for the first of what is hoped will be a series of Archaeological Youth Camps, which would attract middle and high school students to the community college and the project. The connection of the Long and Severance families to abolition has served as an initial vehicle for the establishment of a collaborative relationship between the project and the Institute for African American Affairs and Kent State University, Dr. Diedre Badejo, Director.

After five years, Mark Lewine, Al Lee and Dorothy Salem see the collaborative project not just producing a site with findings that promise original and significant contributions to the social and cultural history of Cleveland. Students have learned to integrate information from archives, photos, street maps, census data, and from long-time residents of the area, along with the material culture history found at the site. Originally begun as an applied field experience for Cuyahoga Community College archaeology students, this project has demonstrated its value as a pedagogical tool, a source for interdisciplinary field research, a setting for collaborative work for regional students from a wide variety of schools, and a source for increasing knowledge about community history. The residents' interest in their neighborhood and the significant connection between college and community has deepened. Community college students who participated had their first contacts with students from regional universities, graduate students, faculty from those universities as well as a museum archaeologist and an archivist from the county archives. Visiting these institutions showed the students viable possibilities for their own future study and work opportunities that they never imagined before.

Such a project should inspire other archaeologists, anthropologists, and historians in museums, community colleges, and universities to join together to create community history research projects for their city or town. In the process the barriers between urban

(Continued on page 15)

MAJOR EXHIBITION ON THE AINU: THE INDIGENOUS PEOPLE OF JAPAN

The story of the Ainu of Japan is not unlike that of the indigenous people of other lands, such as the American Indians and the Aboriginal people of Australia. For thousands of years the Ainu occupied the island of Hokkaido in northern Japan as well as the Kurile Islands, southern Sakhalin, and part of northern Honshu. The different geographic areas represented three distinct territorial subcultures with differences in language, oral history, artifact styles, and ceremonial life. Eventually all the Ainu were resettled in Hokkaido as Russia and Japan took control of their lands. Their name for themselves, "Ainu," means "people" or "humans." Their population numbers around 25,000 today, with many more Ainu mixed with the general Japanese population throughout Japan. Because of discrimination, many people do not make known their Ainu ancestry.

The Ainu are physically distinctive from other Japanese and were once thought to be remnants of a "lost" Caucasoid race. The Ainu have more body hair, including heavy beards, rounder eyes, and less facial flatness. DNA, skeletal, and linguistic studies have shed some light on Ainu ancestry. They appear to be more closely related to the Jomon, the ancestral people of Japan, than the people of western and southern Japan. The ancestors of the Western and Southern Japanese were primarily Yayoi immigrants, who brought rice farming from China and Korea before 300 B.C., and to a lesser extent the Jomon.

It wasn't until 1868 during the Meiji Restoration that modernization efforts had a grave impact on Ainu Society. With increasing trade and industrialization and the opening of Japan to the West, the Ainus' northern island homeland, Ezo, was renamed Hokkaido, and began to be valued for its fish, fertilizers made of fish, and timber. The Japanese were encouraged to emigrate here to farm and take advantage of these natural resources. The Japanese government then initiated efforts to assimilate the Ainu into Japanese society and take away their native rights, land, and resources. By 1899 the government's actions were codified in a "protection act" meant to destroy Ainu culture. The Ainu, however, kept many aspects of their culture alive such as art, music, rituals and beliefs, while much of their material culture was sold to foreign collectors and museums. Today a renaissance of Ainu culture is taking place in which people are again learning the native language and practicing old traditions such as weaving bark cloth and making dugout canoes. An historic event took place on May 8, 1997 when the Japanese government officially recognized the Ainu as a people with a unique language and culture.

Now the American people have an opportunity to learn about the indigenous people of Japan in a new traveling exhibition that opened on April 30 at the Smithsonian Institution s National Museum of Natural History. "Ainu: Spirit of a Northern People" is the first major North American exhibition of Ainu culture and the first to feature contemporary Ainu living traditions as well as ethnography. The curators for the exhibition, Chisato Dubreuil, of Ainu ancestry, and William Fitzhugh, Director of the Arctic Studies Center at the National Museum of Natural History, and project manager David Dubreuil, worked closely with Ainu, American, and Japanese scholars to produce the exhibition. An Ainu carver, Masahiro Nomoto, was brought to the Smithsonian to build for the exhibition a traditional Ainu canoe and a house, which is the center of Ainu life.

The five major themes of the exhibition are: spirituality, which permeates all aspects of Ainu life and their relations with nature; the importance of trade with other Pacific Rim peoples; cultural identity as it has evolved over several thousand years; the vitality of Ainu traditions; and the emergence of fine art in Ainu culture. Perhaps the most extraordinary items of the exhibit are the modern paintings, textile pieces, and sculptures by Ainu artists. In combination with more ancient and traditional pieces, these pieces using modern artistic conventions and materials demonstrate the persistence of traditional Ainu themes and symbols as well as the integration of Ainu people and their artists into the modern world.

The exhibition will be at the Smithsonian through January 2, 2000. A comprehensive catalog with over 50 articles by Ainu scholars is available from the Smithsonian museum shops and the Arctic Studies Center.

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ARCHAEOLOGY SYMPOSIUM FOR LOCAL EDUCATORS

D.C., Maryland, and Virginia teachers are invited to attend "Teaching the Past Through Archaeology," a two-day symposium organized by the Smithsonian's Anthropology Outreach Office and the Society for American Archaeology Public Education Committee, to be held September 22 & 23, 2000. Lectures will cover such topics as the Vikings, ancient diseases, African American archaeology, what bones can tell us about the earliest Americans, and the impact of El Niño on prehistoric populations. Workshops on archaeological concepts, Mayan and underwater archaeology, and teaching with historic places will demonstrate how archaeology can enrich all classroom topics. For more information, contact Ann Kaupp, Department of Anthropology, Smithsonian Institution, Washington, DC 20560; (202) 357-1592; fax: (202) 357-2208; email: kaupp.ann@nmnh.si.edu.

For further information:

Arctic Studies Center homepage at www.nmnh.si.edu/arctic/

Howell, David L. 1995. *Capitalism From Within: Economy, Society, and the State in a Japanese Fishery.* Univ. of California Press.

Kayano, Shigeru. 1994. *Our Land was a Forest: An Ainu Memoir.* Translated by Kyoko and Liki Selden. Westview Press.

Munro, Neil G. 1996. *Ainu: Creed and Cult.* Columbia Univ. Press.

Ohnuki-Tierney, Emiko. 1984. *The Ainu of the Northwest Coast of Southern Sakhalin.* Repr. ed. Waveland Press.

Philippi, Donald L. 1995. *Songs of Gods, Songs of Humans: The Epic Tradition of the Ainu.* Columbia Univ. Press & Univ. of Tokyo Press.

Siddle, Richard M. 1996. *Race, Resistance, and the Ainu of Japan.* Routledge Press.

Ann Kaupp
AnthroNotes Editor

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(*"Urban Field Research Project" continued from page 13*)

community, community college, university, and museum can diminish, and at the very least, student interest in archaeology, anthropology, and other social sciences can increase. For students, learning more about their city's history makes their city come alive for them.

JoAnne Lanouette
AnthroNotes Editor

For further information about the Urban Community Research Project, contact:

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National Museum of Natural History
Washington, DC 20560-0112

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AnthroNotes offers in-depth articles on current anthropological research, teaching activities, reviews of new resources, and summer fieldwork opportunities. *AnthroNotes* was originally part of the George Washington University/Smithsonian Institution Anthropology for Teachers Program funded by the National Science Foundation. It is published free-of-charge in the fall and spring.

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ANTHRONOTES has a three part mission:

1. To more widely disseminate original, recent research in anthropology in order to help readers stay current in the field;
2. To help those teaching anthropology utilize new materials, approaches, and community resources, as well as integrate anthropology into a wide variety of subjects; and
3. To create a national network of anthropologists, archaeologists, teachers, museum and other professionals interested in the wider dissemination of anthropology, particularly in schools.

This newsletter with its cartoons may be reproduced and distributed free-of-charge by classroom teachers for educational purposes. *AnthroNotes* is now available on the WEB (http://www.nmnh.si.edu/departments/anthro.html).

AnthroNotes Staff: P. Ann Kaupp, managing editor; Ruth O. Selig, Alison S. Brooks, JoAnne Lanouette, editors; Robert L. Humphrey, artist. Illustrations, Robert L. Humphrey, copyright 1999. Kathleen Sims, designer.

HAVE YOU MOVED RECENTLY?

Please don't forget to notify *AnthroNotes* editors. If you have not notified us or your forwarding order has expired, the issue is returned marked "Forwarding Order Expired" or the Post Office returns a copy of the back page, discarding the rest of the issue. We have to pay for the initial mailing, pay for the return, and then pay to mail another copy. To keep our expenses down, we will no longer automatically send a second copy of the issue to you. Please help by sending your change of address as soon as possible. *AnthroNotes*' email address is kaupp.ann@nmnh.si.edu.

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ANTHRONOTES

MUSEUM OF NATURAL HISTORY PUBLICATION FOR EDUCATORS

VOLUME 21 NO. 2 WINTER/SPRING 1999-2000

NEW DISCOVERIES IN PALEOANTHROPOLOGY: WHAT'S NEW, WHAT'S TRUE, AND WHAT'S IMPORTANT?

by Alison S. Brooks and Richard Potts

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The headline announces: *"New fossil shakes up our family tree."*

The evening news features an intense, lean and sun-tanned academic pointing out the features on this new lump of bone that will change everyone's view of human evolution. Thousands of young listeners imagine themselves walking across the desert, stumbling by chance on an important skull.

The last four years have witnessed an avalanche of new discoveries from fieldwork, paralleled by new discoveries in the lab. The new laboratory discoveries stem partly from more careful analytical techniques (e.g. refitting of bones and stones or cut mark analyses) and partly from a technological revolution in human origins studies, including computerized data bases, CT scans, extraction of ancient DNA, studies of modern DNA as a key to the past, studies of sediment chemistry, and new dates and dating techniques. Few realize that most of what's new in human evolution actually comes out of the lab, after months or years of painstaking research.

Are we better off now than four years ago when it comes to answering the big questions of human evolution: What *makes* us human? What is unique about our species *(sapiens)* or our genus *(Homo)*? What is shared with older ancestors or with the African apes? What *made* us emerge as human? How did humans evolve in time and space? Why did we evolve the way we did ? What allowed us to expand out of Africa and colonize so much of the world's surface that we now endanger the world itself? What gave us the edge over the Neanderthals? With the help of the new technologies and an expanding data base, we are now in a better place to begin to answer these questions than ever before, and we are also better able to understand the stories we read in the daily newspapers reporting "the latest finds."

FROM FIELD TO FRONT PAGE

Few fossils come to light intact or even in large pieces, and rarely does an excavation of an archaeological site yield any human fossils at all. Most hominid fossils have been found by chance or by walking over the landscape in large-scale surveys of fossil-bearing sediments determined by scientists to be of an appropriate age for hominids to have lived there. Field workers learn to recognize tiny fragments of skull or long bone as potentially human. They learn to detect the gleam of tooth enamel in the slanting light of the afternoon sun and to follow a trail of fragments uphill until it disappears into the hillside. The fossil on the table probably shattered and was dispersed as it eroded out onto the surface where a paleontologist could spot it.

One bit of human bone may result in a massive earth-moving operation, as the surrounding earth is scraped and sifted to recover every possible piece no matter how small. At the end of a day or after a week sifting, the archaeologist's bone bag bears little resemblance to the reconstructed skull on the newsroom table. Only after months of preparatory work — finding which pieces join together and modeling the

INSIDE: FAMILY FOLKLORE ■ WEB SITES ■ INDIAN LANGUAGE MAP PUBLISHED

missing parts—does the skull begin to take shape. Only then can it begin to undergo the comparative study that can answer the question: Is this really something new, something that means a new species or a new genus? Or is it the same as an earlier find, only bigger, perhaps a big male? While the palaeontologists piece together the fossil, other laboratory scientists are hard at work figuring out its age, its environment, and its behavior. These studies are based on the bones, stone tools, and associated sediments from which the fossils or tools eroded.

Publication of a new hominid species usually occurs in either the British journal *Nature* or the American journal *Science*. The controversy often begins immediately. Is the fossil actually associated with the material used to date it? What are the possible sources of error in the dating method used? Is it really different enough from existing fossils to justify assignment to a new species?

The question about a new species is especially difficult. In living organisms, a species is defined as a group of organisms that can mate and produce fertile offspring. But with fossils, unlike living organisms, there are no 'tests' for determining whether something new is or is not a separate species, and many morphological species indicators like plumage or coat color are missing. Designation of fossils at the genus level is even more controversial, as genus implies both shared morphological pattern, implying a common adaptive strategy and common descent from a distant common ancestor.

This article discusses new finds affecting our family tree, including two new species, one from Europe (Spain) and one from Africa (Ethiopia). A second major section, "News From the Lab," focuses on the re-analysis of research data using new technologies, reflected in news stories about chimpanzee learned behavior, large-scale mammalian extinction, and the relationship between brain size and body mass in understanding our early ancestors. Finally, a new look at *Homo habilis*, *Homo erectus* and the Neanderthals emphasizes once again that what we know in science always keeps growing as new information and technologies improve with time.

CORRECTION: The last issue of *AnthroNotes* should have been Volume 21 No. 1, not Volume 22.

OUR FAMILY TREE: NEWS FROM THE FIELD

Two new species joined the family tree between 1997 and 1999: *Homo antecessor* from Spain and *Australopithecus garhi* from Ethiopia.

Homo antecessor: A New Species From Europe

Homo antecessor is based on fragments from the TD6 level at the Gran Dolina cave, near Atapuerca, Spain. Its approximate date of 800,000 comes from the fact that the fossils lie below a magnetic change point. The sediments above have a magnetism similar to that of today's Earth, but the sediments below have a reversed magnetism, that is the "north" recorded by the sediments is actually "south" today. Evidence of magnetic reversals occurs in sediments all over the world and the most recent shift from "reversed" back to "normal" has been dated by argon laser techniques (see page 3) to 780,000-791,000 years. The fragments include the lower face of a child with several teeth, a fragment of frontal bone (forehead region), a small piece of a jaw and several long bone fragments. At least six individuals are represented, and some of the bones show cut marks made while the bone was fresh, a possible sign of cannibalism.

The discoverers of *H. antecessor* (Bermudez de Castro *et al.)* argue that the shape of the nose region is not that of *H. erectus* but instead resembles some features of *H. sapiens* and Neanderthals; hence the name "antecessor". They argue that it is the ancestor of both Neanderthals and modern humans before the two lines diverged. Others suggest that it may be the ancestor of a Neanderthal lineage that split off from the modern human lineage before *antecessor*. Without more pieces from Gran Dolina or other European fossils from the same time period, however, it is difficult to say whether its separate status will continue. It could also prove to be just an early form of a European species known as *H. heidelbergensis* that lived in Europe from about 500,000 to about 200,000. The dating is also only approximate since we do not know how much time elapsed between the burial of the fossil and the magnetic shift at 780,000.

The interesting question raised by the naming of a new European species at an early date is the antiquity of the separation between a European human lineage leading to Neanderthals and an African human lineage leading to modern humans. Were Neanderthals, who do

not appear until around 200,000 years ago, the final branch of a large European tree, all adapted to colder and more seasonal conditions than elsewhere in the Old World? Did the split between the two lineages occur after or before *antecessor*? In either case, if the split is ancient, how do we explain the later development of behavioral similarities between Neanderthals and their African and Near Eastern cousins? Could this be a case of parallel evolution? Or is this new member of the family tree just a temporary offshoot that died out without descendants?

A Second New Species

In Africa, another much older new species, *Australopithecus garhi*, was named by Asfaw *et al.* in 1999. The word *garhi* means 'surprise' in the local Afar language. *A. garhi* comes from a region on the west bank of the middle part of the Awash River, in the northern Rift Valley of Ethiopia. The partial cranium and possibly associated jaw and limb bones from a different site are dated to 2.5 million years ago by a highly accurate technique that uses lasers to release and measure tiny amounts of argon gas trapped in small crystals of volcanic sediments.

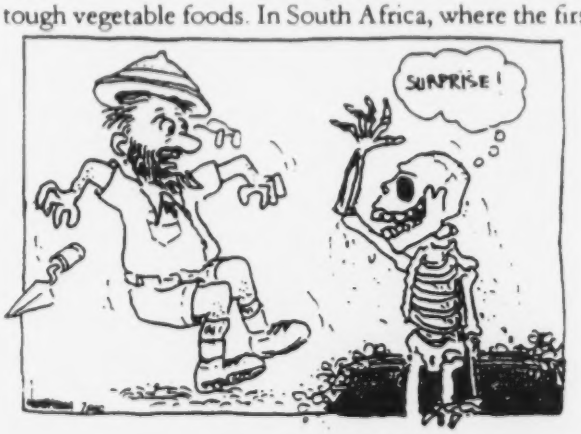
A. garhi was a surprise because it displayed a combination of features not seen before. Big cheek teeth (molars and premolars) with thick enamel and what may be a sagittal crest recall the robust australopithecines (*Paranthropus*) and place the fossil in the genus *Australopithecus*. The brain case is quite small (ca. 470 cc). However, unlike the robust australopithecines, *A. garhi* does not have reduced incisors, and the face does not have the bony reinforcements in the cheek that give the australopithecine face a concave or "dished" appearance. Arm and leg bones found 300 meters away from the skull are from a single individual, who may or may not belong to the same species as the skull. But the limbs are unique for the time period — arms as long as Lucy's for climbing, but much longer legs for walking bipedally, suggesting that bipedal walking was well-established before humans gave up the trees altogether. *A. garhi* possibly could be the ancestor of our own genus, but at least one skeptic has suggested it may be a female robust australopithecine.

Did Bipedalism Develop From Knuckle-Walking?

Recently researchers working in the collections of ape skeletons at the Smithsonian were studying a ridge on the wrist end of a forearm bone (radius) found in knuckle-walking apes. On a whim, they decided to see if this ridge was present in the 'Lucy' skeleton. To their surprise, Lucy and other australopithecine fossils had the ridge, suggesting that we may be descended from a knuckle-walking ancestor. Other scholars, however, argue that the knuckles on Lucy's hand-bones are not broad for weight-bearing like the knuckles of apes, making it unlikely that australopithecines actually used this form of locomotion. This study helps to reconcile evidence from anatomy with the strong DNA evidence that chimpanzees are more closely related to humans than to gorillas. It also raises the question of why upright walking would evolve from an ancestor that was already adapted to life on the ground.

"Always Something New Out of Africa" (Ancient Greek Proverb cited by Pliny the Elder and C. Darwin, 1859)

Although 2.5 million years ago (mya) is a critical time in the transition to a human way of life based on meat-eating and stone tool manufacture, it is not a well-documented period in human evolution. Relatively few fossils from this time period have been found in East Africa. *A. afarensis*, whose skeleton is known to the world as 'Lucy' but to Ethiopians as 'Dinkanesh', had disappeared by about 2.7 mya. Of the existing fossils dating to around 2.5 mya, most belong to a group called "robust australopithecines." These are sometimes grouped in the genus *Paranthropus* and are distinguished by their massive molars and premolars, used to chew tough vegetable foods. In South Africa, where the first



australopithecines were discovered back in the 1920s and 1930s, *Australopithecus africanus*, the first named species of *Australopithecus*, is the only known hominid in this time interval. *Australopithecus africanus* had large chewing teeth relative to *Homo*, but smaller teeth and a less massive jaw and face than the robust group.

Around 2.3 to 2.1 million years ago, a few fossils with larger brains and/or smaller chewing teeth have been included in our own genus *Homo*, in part because of the change in tooth and brain proportions, and in part because they were associated with crude stone tools. One of the most recently found and the oldest member of this group is a fossil upper jaw described by Kimbel *et al.* from the Hadar area of Ethiopia, also in the Awash Valley, associated with early flake tools and dated to 2.3 mya. Unfortunately, scientists have not found any part of the braincase, associated limbs, and other features that would help to determine its lifestyle and evolutionary relationships.

Another new, early African fossil is making headlines while still in the ground. Fossil foot bones from a very old layer—perhaps 2.8-3.1 mya—at the Sterkfontain cave near Johannesburg, South Africa, were published four years ago. Last year, the rest of the skeleton was discovered beneath where the foot bones were found. It is apparently an entire skeleton of an *Australopithecus africanus* that fell into the cave and lies crumpled on the floor head down and feet turned up. It will be years before scientists study all the details of this fascinating find, as the bones are encased in solid rock that formed around them and must be carefully picked apart.

Oldest Stone Tools

The oldest known stone tools come from Ethiopia, about 100 km to the north at Gona, near Hadar. Although a firm date of between 2.5-2.6 mya and a brief description were published in 1997, debate on the nature of these tools is suspended until they are published in more complete form by their excavator, S. Semaw. Other stone tools from the Lake Turkana basin in northern Kenya date to 2.3 mya. These tools from the site of Lokalelei were described in 1999 by Roche and coworkers as surprisingly elaborate, involving the removal of as many as 30 flakes from a single core. The record suggests that stone tools appear with and may even precede the appearance of members of our own genus, *Homo*. Previous work had suggested that the earliest toolmakers were not capable of elaborate toolmaking sequences involving many steps, but this new research suggested that toolmaking abilities were somewhat sophisticated even by 2.3 mya. The analysis of the older tools from Gona will be extremely interesting, particularly as no members of the genus *Homo* are known from this age.

No stone tools were found in direct association with *A. garhi*, but there was indirect evidence of their use. In the area that yielded the limb bones, there were a number of bones of extinct horses and antelopes that showed sign of butchery. Deep scratches with the characteristic sharp edges of stone tool cut marks indicate where meat and sinews had been sliced from the bone, and hammerstone impact fractures made while the bones were fresh show how they had been broken open for marrow. If this behavior can be attributed to *A. garhi*, then this hominid clearly shares behavioral features with later humans, even though its brain was still small and the teeth still large. It may be an early indicator of what we now recognize as a common pattern of *Homo*, in which new behaviors drive and select for changes in morphology— tools before brains.

Behavioral innovation in early hominids may not be so surprising. Assembly of a large database of chimpanzee behaviors allowed researchers to demonstrate last year that chimpanzees display a wide range of different behaviors across Africa, all of them learned and transmitted from one generation to the next. Some groups of chimpanzees use sticks to fish for termites; others use rocks and sticks to crack nuts. Some hunt small animals; others rarely do. To a certain extent, then, chimpanzee behavior fits the basic definition of human culture, habits and practices that are particular to each society and are passed on through learning.

OUR FAMILY TREE: NEWS FROM THE LAB

Some of the most important news on the hominid front does not derive from new fieldwork or fossil finds, but from laboratory experiments and from reinterpretations of existing finds using new technologies. These range from CT scans to statistical techniques made possible by huge computerized databases and new sophisticated computer modeling.

In a long-running laboratory experiment at Indiana University, a bonobo or "pygmy chimpanzee" named

Kanzi continues to learn stone tool making, although his favorite method is to throw the stone against something hard until it shatters. His abilities and the problem-solving experiments being conducted with orangs at the National Zoo in Washington, D.C. show that we have underestimated the cognitive abilities of our closest relatives. It also demonstrates how sophisticated the oldest tools at Lokalelei were, compared to those made by Kanzi.

A large database of mammalian fossils from the Turkana basin allowed researchers at the Smithsonian to test whether or not a major dry spell 2.5 million years ago caused the extinction of many East African animals and their replacement by savanna-adapted species, including early humans (e.g., *A. garhi).* The researchers found that the appearance of new species and the disappearance of old ones were spread throughout the 1 million year period between 3 and 2 mya in the Turkana basin, which offers the richest and best dated record of animal evolutionary change in Africa during this critical interval. Thus the hypothesis of a major "turnover pulse" at 2.5 mya was not supported by the data. The researchers found, however, that after a gradual rise in the number of species up to 2 mya, a significant drop in species numbers occurred, especially around 1.8 mya.

Recent research on the larger brain sizes that mark the emergence of *Homo* also utilizes new statistical databases and techniques for determining body mass from the upper leg bone (femur). When brain size is calibrated by body size, it turns out that brain size increases between 2.5 and 1.8 mya, but then remains relatively constant from 1.8 to 0.6 mya. Brains were not getting bigger through the early Pleistocene, people were! What is surprising, after more than a million years of roughly the same brain size, is the dramatic leap in brain size at around 600,000–700,000 years ago, as new species like *H. heidelbergensis* take over. What was the reason for this huge increase in relative brain size? New environments colonized? More variable environmental conditions? New social structures and ways of making a living? The data are unclear but new work in the Middle Pleistocene is suggesting an earlier and earlier emergence of complex abilities.

NEWS OF *HOMO HABILIS*, *HOMO ERECTUS*, AND THE NEANDERTHALS

Is *Homo habilis* really *Homo?*

The earliest members of the genus *Homo* are *Homo habilis*, defined on the basis of Olduvai Gorge specimens in 1964, and *Homo rudolfensis*, defined on the basis of East Lake Turkana specimens in 1986. Since 1985 accumulating evidence has demonstrated that at least one of these species still maintained a number of specializations for life in the trees, like long arms, short legs and curved fingers. In addition, these hominids exhibit very little of the marked reduction in tooth size that characterizes our genus and leads to our smaller faces. *Homo* was supposedly characterized by large brains, language, tool-dependence, and manual dexterity. New data have shown that the brains of these fossils are not large compared to their body mass, and that we cannot determine whether or not they had language abilities to a greater extent than the apes. Tools now appear before the first fossil attributed to *Homo* and occur with *Australopithecus* and *Paranthropus* as well. New studies of hand function show that either the hand of *H. habilis* was not as fully modern as we had supposed or that apes possess many of the same manipulative abilities. In a major review of these issues, Wood and Collard suggest that *H. habilis* and *H. rudolfensis* do not share the adaptations characteristic of later members of the genus *Homo* and should be grouped instead with *Australopithecus.*

Homo Erectus: Fuel for Thought?

If Wood and Collard's proposed reassignment of *H. habilis* and *H. rudolfensis* to the *Australopithecus* genus is widely adopted, the first member of the genus *Homo* will be the species H. erectus or its African relative *H. ergaster.* These fossils are best represented by the almost complete skeleton of an adolescent boy from Kenya dated to 1.5 mya. He was tall and larger-brained and had reduced chewing teeth. A controversial recent article cites these features to suggest that cooking was already part of the *erectus* cultural repertoire and may have been an essential adaptation allowing *H. erectus* to spread out of Africa. There is no direct archaeological evidence for cooking at early African sites, with the possible exception of some burned bones from South Africa (see *AnthroNotes 18(2)* Spring 1996.) At Koobi Fora, on the

east side of Lake Turkana, other support for early human use of fire comes from burned patches whose magnetic properties studied in the laboratory may indicate the use of fire by humans, since human-tended fires have a higher temperature and longer "burn-time" in a very small area than most bush fires. Natural bush fires, however, cannot be entirely ruled out as causes of either the burned features or the charred bones.

Even thick beds of what appears to be ash may not indicate fire. "Ash" from Zhoukoudian in China, the *Homo erectus* site listed in most textbooks as the oldest site with controlled fire, may not be the remains of fire after all, although it is only about 500-300,000 years old. The sediment, studied by a new infrared technology, does not have the chemical constituents or characteristics of wood ash. Some of the bones, however, were charred and may have been burned somewhere else and carried or rolled into the area of the cave sampled, indicting that fire was at least in use by this time.

When did *H. erectus* arrive in Asia? Or was it an earlier species that made the trip? Stone tools reported from the southeast Asian island of Flores in 1998 would seem to suggest that not only was *erectus* in the region by 1.5 mya, but also came in boats or had the capacity to make them! This is a good example of a story that has not been widely accepted. Are the stone tools really tools? Or just chipped rocks from a stream bed? Is the date a good one? (The *next oldest* tools in southeast Asia are less than 700,000 years old and may be only 40,000 years old!). There is mounting evidence from both Java and China, however, that hominids were in east and southeast Asia by about 1.5 mya.

Another new Asian find that is challenging current models are the stone tools from the Bose basin, South China. For over a half century, archeologists have thought that large bifacial handaxes characterized the stone technology of Africa and western Asia and Europe for most of the Pleistocene, while simpler stone technology typified East Asia. The boundary between western bifaces and the more casual flake-and-core industries in the east is known as the "Movius line," after the Harvard prehistorian who first described it in the 1940s. The Movius line has been used to suggest that Asian populations of *Homo erectus* and later hominids did not have the same capabilities as hominids in the west. Excavations by Potts, Huang, and their team from the Smithsonian and the Chinese Academy of Sciences have shown, however, that large bifaces were made in South China around 800,000 years ago. The total collection of stone tools from the Bose basin differs in detail from the Acheulean handaxes collections in the west. But in stone flaking ability and the overall shape and size of the large tools, the Bose tool collection is strikingly similar to stone technologies made at the same time in Africa.

Further damage to the Movius line comes from two sites in northern Japan, Takamori and Kamitakamori, dated to more than 250,000 years ago and possibly more than 500,000 years ago, in an island region of the world once thought to be occupied only towards the end of the Pleistocene. Located in the mountains west of Sendai, the tools include well-made symmetrical axes or adzes, chipped on both sides. This symmetrical and bifacial approach to tool-manufacture is characteristic of the Acheulean industry found from India to England and south to the Cape of Good Hope after 500,000 years ago. Such tools are not found in southeast Asia, at least not until very late in the Pleistocene.

The Japanese tools are not "Acheulean," and do not share the stylistic or functional attributes of "hand-axes," but they do exhibit similar capabilities. In addition, some of the small bifacial tools are grouped in discrete pits and include pieces of several different colorful raw materials. Not only have the raw materials been transported over many kilometers, but the arrangement suggests to the excavators (Kajiwara and others) an early example of symbolic behavior, indeed one of the earliest examples anywhere in the world. Others have questioned the age determination, the stratigraphy, and the association between the dated material and the artifacts, but a recent fact-finding expedition to the sites by an international team could not find any problems with the dating or associations. The combined Japanese and Chinese finds indicate that the Movius line model is flawed, and at the very least we must look for new interpretations of *H. erectus* behavior in Asia.

Neanderthal News

At the more recent end of the human evolutionary story, the finds are equally dramatic and equally split between new field results and restudy of older materials with new techniques. Views of the Neanderthals themselves have

been shaken up by a new fossil child from Portugal. Dated to only ca. 25,000 years ago, long after the Neanderthals are thought to have disappeared from Europe, the fossil child is said to display some Neanderthal features in its skeleton. In a heated exchange in the pages of the *Proceedings of the National Academy of Sciences*, Erik Trinkaus, the senior morphologist in the study, suggested it was an example of hybridization between Neanderthals and modern humans, while Ian Tattersall, another authority on Neanderthals, argued that this is not demonstrated.

The genetics revolution has also had an impact on views of the Neanderthals as well as on other developments in human history. Two recent studies of mitochondrial DNA (passed only through the female line), which was extracted from the original Neanderthal fossil, show that it is *very* different genetically from ourselves. The differences between us and the Neanderthals are so great that geneticists estimate that our ancestors split off from them at least 600,000 years ago!

More and more Neanderthal sites show evidence of cannibalism– human bones smashed and cut and treated like other faunal remains. This may confirm an analysis of the bone chemistry of Neanderthals published in 1992 that indicates they were almost exclusively carnivorous. The debate over Neanderthal language continues. One study by Kay *et al.* suggests that the bony canal containing the nerve for the tongue muscle used in speech was as large in Neanderthals as in ourselves and shows that they spent a lot of time in oral communication.

In Africa, the contemporaries of the Neanderthals were early *Homo sapiens*, with more modern morphology. One aspect of this morphology, perhaps *the defining* aspect, was the repositioning of the face beneath the braincase instead of out in front, creating a new relationship between the tongue and the back of the throat that facilitated speech. This new relationship as discussed by Lieberman can be most clearly seen in the morphology of the sphenoid, the bone that divides the braincase from the face and cradles the pituitary gland just behind the nose. Since most of this morphology is *inside* the skull, studying it requires CT scans of the fossils, a new application of this technology. Most hospitals have down times late at night when they are willing to allow use of their machines by paleontologists. The Smithsonian's division of physical anthropology has its own CT scanner. Some CT scans of important fossils are even available on the web [www.anthro.univie.ac.at/bodo/bodo/html.]

Africans may have looked modern when Neanderthals still occupied Europe, but whether or not their *behavior* was also modern is a major debate involving Brooks and others. New evidence from South Africa itself suggests that these early members of our species already were catching ocean fish and making bone-tipped spears, much like the inhabitants of several sites excavated by Brooks in the eastern Democratic Republic of Congo, dating from ca. 80,000. Other early sites of around this age have engraved and notched ostrich eggshells and bones, as well as masses of red ocher. Evidence for other sophisticated and complex behaviors by the African contemporaries of Neanderthals is accumulating rapidly as new regions of Africa are explored.

Journalists know the public is hungry for news about our human origins, and stories of our distant past appear with increasing frequency. The need to educate our students and the general public more broadly about science and anthropology has never been more clear.

FOR FURTHER READING

Asfaw, B.; White, T.D.; Lovejoy, O.; Latimer, B.; Simpson, S. and G. Suwa. 1999. "Australopithecus garhi: A New Species of Hominid From Ethiopia." *Science* 284: 629-635. See also: Locke, R. 1999. " The First Human?" *Discovering Archaeology* 1(4): 32-39.

Clarke, R.J. 1998. "First Ever Discovery of a Well-preserved Skull and Associated Skeleton of Australopithecus." *South African Journal of Science* 94: 460-463. (See also story on website www.discovering archaeology.com.)

Behrensmeyer, A.K., Todd, N.E., Potts, R. and G.E. McBrinn. 1997. "Late Pliocene Faunal Turnover in the Turkana Basin, Kenya and Ethiopia." *Science* 278: 1589-1594.

Bermudez deCastro, J.M., Arsuaga, J.L., Carbonell, E., Rosas, A., Martinez, I., and M.Mosqueria. 1997. "A Hominid From the Lower Pleistocene of Atapuerca,

Spain: Possible Ancestor to Neandertals and Modern Humans." *Science*. 276: 1392-1395.

Boesch, C, and Tamasello, M. 1998. "Chimpanzee and Human Cultures." *Current Anthropology* 39: 591-614.

Defleur, A, White., T., Valensi, P., Slimak, L. and Crégut-Bonnoure, E., 1999. "Neanderthal Cannibalism at Moula-Guercy, Ardèche, France." *Science* 286: 128-131 (Also commentary by E. Culotta, "Neanderthals Were Cannibals, Bones Show" p. 18b-19b.)

De Heinzelin J., Clark, J.D, White, T.D., Hart, W., Renne,P., WoldeGabriel, G., Beyene, Y., and E. Vrba. 1999. "Environment and Behavior of 2.5-million-year-old Bouri Hominids." *Science* 284: 625-629.

Delson Eric. 2000. "Australopithecus Garhi." In *Encyclopedia of Human Evolution and Prehistory*, 2nd Ed., pp 124-125. Edited by E. Delson, I Tattersall, J. van Couvering and A.S. Brooks. Garland Press.

Duarte, C., Mauricio, J., Petitt, P.B., Souto, P. Trinkaus, E., van der Plicht, H., and J. Zilhao. 1999. "The Early Upper Paleolithic Human Skeleton From the Abrigio do Lagar Velho (Protugal) and Modern Human Emergence in Iberia." *Proceedings of the National Academy of Sciences* 96: 7604-7609.

Henshilwood, C. and J. Sealey. 1997. "Bone Artifacts From the Middle Stone Age at Blombos Cave, Southern Cape, South Africa." *Current Anthropology* 38: 890-895.

Hou, Y., Potts, R., Yuan, B., Guo, Z., Deino, A., Wang, W., Clark, J., Xie, G., and Huang, W. 2000. "Mid-Pleistocene Acheulean-like Stone Technology of the Bose Basin, South China." *Science* 287: 1622-1626. (Also commentary by A. Gibbons "Chinese Stone Tools Reveal High-Tech *Homo erectus*," p. 1566.).

Kay, R. F., Cartmill, M., & Balow, M. (1998). "The Hypoglossal Canal and the Origin of Human Vocal Behavior." *Proceedings of the National Academy of Sciences USA* 95:5417-5419. (Also rebuttal by DeGusta, D., Gilbert, W. H., & Turner, S. P. 1999. "Hypoglossal Canal Size and Hominid Speech." *Proceedings of the National Academy of Sciences USA* 96, 1800-1804.)

Kimbel, W.H., Walter, R.C., Johanson, D.C., Reed, K.F., Aronson, J.L., Assefa, Z., Marean, C.W., Eck, G.G., Bobe, R., Hovers, E., Rak, Y., Vondra, C., Chen, Y., Evensen N.M., and P.E. Smith. 1996. "Late Pliocene *Homo* and Oldowan Tools from the Hadar Formation (Kada Hadar member), Ethiopia." *Journal of Human Evolution* 31: 549-561.

Klein, Richard G. 2000. "Archaeology and the Evolution of Human Behavior." *Evolutionary Anthropology* 9 (1): 17-36.

Krings, M. Stone, A., Schmitz, R.W., Kraintzk, H., Stoneking, M. and S. Pääbo. 1997. "Neandertal DNA Sequences and the Origin of Modern Humans." *Cell* 90: 19-30.

Krings, M., Geisert, H., Schmitz, R.W., Krainitzki, H., and S. Pääbo. 1999. "DNA Sequence of the Mitochondrial Hypervariable Region II From the Neanderthal Type Specimen." *Proceedings of the National Academy of Sciences USA* 96:5581-5585.

Lieberman, D.L. 1998. "Sphenoid Shortening and the Evolution of Modern Human Cranial Shape." *Nature* 393: 158-162. Also Spoor, F., Dean, M.C., O'Higgins, P., and Lieberman, D.E., 1999. "Anterior Sphenoid in Modern Humans." *Nature* 397: 572.

Morwood, M.J., O'Sullivan, P.B., Aziz, F., and Raza, A. 1998. "Fission-Track Ages of Stone Tools and Fossils in the East Indonesian Island of Flores." *Nature* 392: 173-176. (Also commentary by A Gibbons 1998. "Ancient Island Tools Suggest *Homo Erectus* was a Seafarer." *Science* 279: 1635-1637.)

Richmond, B. G., & Strait, D. S. (2000). "Evidence that Humans Evolved From a Knuckle-Walking Ancestor." *Nature* 404, 382-385. And "News and Views" comment by Collard, M., & Aiello, L. C. (2000). "From Forelimbs to Two Legs." *Nature* 404, 339-340.

Roche,H., Delagnes, A., Brugal, J-P., Feibel, C., Kibunjia, M., Mourre, V., and P. J. Texier. 1999. "Early

Hominid Stone Tool Production and Technical Skill 2.34 Myr Ago in West Turkana, Kenya." *Nature* 399: 57-60.

Rowlett, R., Davis, M.G., and Graber, R.B. 1999. "Friendly Fire: The First Campfires Helped Hominids Survive the Night." *Discovering Archaeology* 1(5):82-89.

Ruff, C. B., Trinkaus, E., & Holliday, T. W. (1997). "Body Mass and Encephalization in Pleistocene *Homo*." *Nature* 387: 173-176.

Semaw, S., Renne,P., Harris, J.W.K., Feibel, C.S., Bernor, R.L., Fessaha, N., and K.Mowbray. 1997. 2-5 "Million-year-old Stone Tools from Gona, Ethiopia." *Nature* 385: 333-336.

Tattersall, Ian. 2000. "Paleoanthropology: the Last Half-Century." *Evolutionary Anthropology* 9(1): 2-16.

Tattersall, I. and Schwartz, J.H. 1999. "Hominids and Hybrids: The Place of Neanderthals in Human Evolution." *Proceedings of the National Academy of Sciences* 96: 7117-7119.

Weiner, S., Xu, Q., Liu, J., Goldnerg, P., and O. Bar-Yosef. 1998. "Evidence for the Use of Fire at Zhoukoudian, China." *Science 281*: 251-253.

Wong, Katy 2000. "Who Were the Neanderthals?," with contributions by Erik Trikaus, Cidalia Duarte, Joao Zilhao, Franceson d'Errico, and Fred H. Smith. *Scientific American* 282(4): 98-107.

Wu, X. 1999. Letter to *Science* and reply by Weiner et al. *Science* 283: 299.

Whiten, A., Goodall, J., McGrew, W.C., Nishida, T., Reynolds, V. Sugiyama, Y., Tutin, C.E.G., Wrangham, R.W. and Boesch, C. 1999. "Cultures in Chimpanzees." *Nature* 399: 682-685.

Wood, B. and M. Collard 1999. "The Changing Face of Genus *Homo*." *Evolutionary Anthropology* 8(6): 195-207.

Wrangham, R.W., Jones, J.H., Laden, G., Pilbeam, D., and B. Conklin-Brittain. 1999. "The Raw and the Stolen: Cooking and the Ecology of Human Origins." *Current Anthropology* 40(5):567-594.

www.tfu.ac.jp/kenkyushitsu/kajiwara (on Takamori tools). See also stories in www.discovering archaeology.com (on recent Japanese finds of postholes).

www.nationalgeographic.com (on footprints at Langebaan, and other stories).

www.paleoanthro.org (abstracts of papers for paleoanthropology meeting in Philadelphia April 4-5, 2000 and "Palaeoanthropology in the News" featuring current and recent newspaper stories.)

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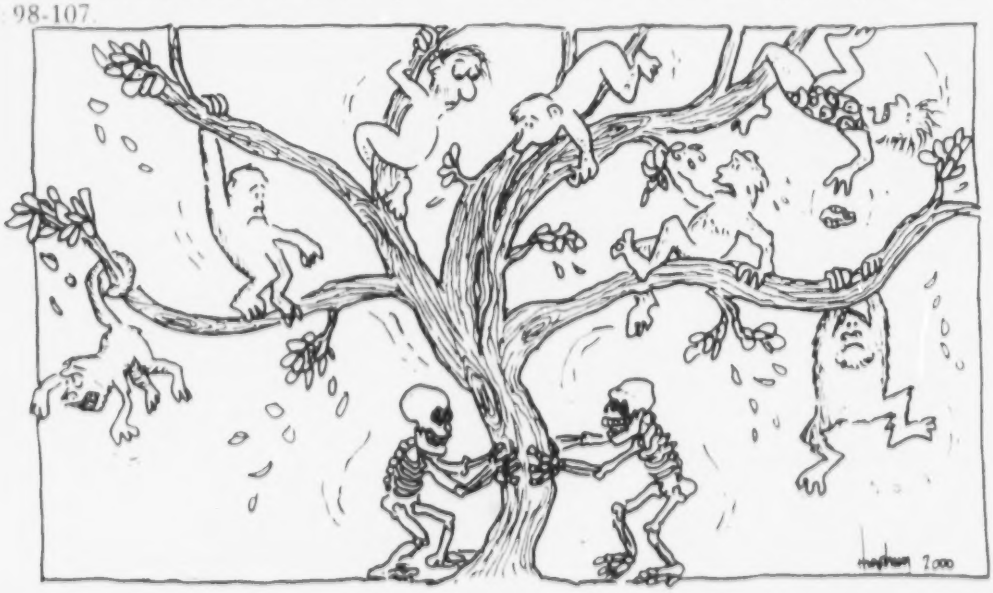

TEACHER RESOURCES

Web Sites Relating to Human Evolution

Web sites compiled by the Smithsonian's Human Origins Program of interest to teachers and students:

www.indiana.edu/~origins/
Consists of full text lectures with photographs and images. Includes links to other sources of information. A great site for students.

www.wsu.edu:8001/vwsu/gened/learn-modules/top_longfor/lfopen-index.html
A good introductory page with plentiful information presented clearly.

www.mc.maricopa.edu/anthro/exploratorium/hominid_journey/central.html
A site with excellent graphics that touches upon most of the major topics on human evolution.

www.sscf.ucsb.edu/~hagen/crania/
A site put together by Philip Walker and Edward Hagen with some amazing 3-D skulls using Shockwave plug-ins. Download time for the Shockwave files can be a bit long on a 28.8 modem, but the effort is worth it.

www.emory.edu/LIVING_LINKS/
A useful site for those interested in primatology in general. The research center focuses around a population of chimpanzees at the Yerkes Primate Center at Emory University in Atlanta. Offers some great videos showing basic chimpanzee behavior.

www.indiana.edu/~origins/
Full text lectures with photographs and accompanying images. Includes a number of links that students will find useful.

ww.wsu.edu:8001/vwsu/gened/learn-modules/top_longfor/lfopen-index.html
A good introductory page with abundant information presented clearly.

ww.mc.maricopa.edu/anthro/exploratorium/hominid_journey/central.html
This site, with great graphics, touches upon just about all of the major topics of human evolution.

Other Recommended Sites:

Harvard University Biology links
mcb.harvard.edu/BioLinks.html

Ask Eric Vitual Library
ericir.syr.edu/Virtual/index.html

Education Index Anthropology Resources
www.educationindex.com/anthro/

Stones and Bones Physical Anthropology Center, LAUSD
www.lalc.k12.ca.us/catalog/providers/170.html

The National Museums of Kenya
www.museums.or.ke/

The Olorgesailie Site Museum, National Museums of Kenya. **www.museums.or.ke/psmolor.html**

www.cruzio.com/~cscp/econ/htm
This site has new information about China; argues against the out-of-Africa theory of modern human origins.

The Paleoanthropolgy Society
www.paleoanthro.org/
This web page of the professional organization for palaeoanthropology has a number of good links, field schools, etc.

Jeanne Sept's links to other sites
www.indiana.edu/~origins/links/evolinks.html
Most of these links have been reviewed by the University of Indiana faculty.

Institute of Human Origins
http://www.asu.edu/clas/iho/index.html
Highly recommended. Focuses on new work in Ethiopia and elsewhere.

The Neanderthal Museum
www.neanderthal.de/
An excellent site.

Scientific American Discovering Archeology Magazine
www.discoveringarchaeology.com/index.shtml
This is actually an excellent news source and has an up-to-date newpaper and an AP citation file. Editors include faculty from Harvard and elsewhere

Pictures of Record
www.picturesofrecord.com/
A commercial site for ordering images and slides.

Ancestors Unearthed Fieldnotes, Carnegie Museum of Natural History
www.clpgh.org/cmnh/exhibits/ancestors/index.html.
This site relates to their new exhibits.

TOWN MEETING ON TEACHING EVOLUTION

In light of recent statewide decisions affecting the teaching of evolution, the American Institute of Biological Sciences (AIBS) and the National Association of Biology Teachers held a town meeting on March 22 in Arlington, Virginia. The evening event was held in conjunction with the AIBS annual meeting, which was co-sponsored and hosted by the Smithsonian Institution.

The meeting room was packed with scientific researchers and educators from across the country who heard from the following speakers: Rodger Bybee (executive director, Biological Sciences Curriculum Study); Eugenie Scott (executive director, National Center for Science Education); David Wake (professor of integrative and comparative biology, Univ. of California, Berkeley); Brad Williamson (AP biology teacher at Olathe East High School, Olathe, KS); John Herron (Univ. of Washington, Seattle); and moderator M. Patricia Morse (Zoology Department, Univ. of Washington).

While 66% of Americans want evolution to be taught as science, textbooks are putting in the disclaimer that evolution is "theory not fact." Rodger Bybee, author of *Achieving Scientific Literacy: From Purposes to Practices* (1997), summarized four challenges in teaching evolution: 1) to introduce the scientific concepts of evolution; 2) to develop an understanding of inquiry and the nature of science for students; 3) to develop new materials and approaches for teaching about evolution and the nature of science; and 4) to support science teachers.

The speakers agreed that good curriculum materials on evolution are lacking. Using the National Science Education Standards, teachers and researchers need to become partners to produce stimulating materials for classroom use—and even bring back living organisms into the classroom for teaching evolution, advocated Brad Williamson, Kansas high school biology teacher.

Audio tapes of the town meeting are available for $10.00. Call (202) 628-1500 ext. 261; fax: (202) 628-1509 or email: cmoulton@aibs.org.

Related Web Sites:

American Institute of Biological Sciences
www.aibs.org

National Association of Biology Teachers
www.nabt.org

Society for the Study of Evolution
An international organization of biologists actively studying evolution at major universities and research institutions throughout the world.
http://lsvl.la.asu.edu/evolution/

National Center for Science Education, Inc. (NCSE)
www.natcenscied.org/
Provides advice and support for teaching evolution.

National Academy of Sciences "Teaching About Evolution and the Nature of Science." Available online.
www.nap.edu/reading room/books/evolution98

www.talkorigins.org
This site counters creationist arguments against paleoanthropology, but includes generally interesting information on evolution as well. One particularly useful portion of this site is a FAQ (frequently asked questions) area devoted to human origins: *www.talkorigins.org/faqs/fossil-hominids.html*

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INDIAN LANGUAGE MAP

The University of Nebraska Press has published the map "Native Languages and Language Families of North America," compiled by Ives Goddard. It is available in two formats. The "Folded Study Map" (20" x 22 1/2") is identical to the map in the pocket of Volume 17, *Languages, of the Handbook of North American Indians*, except for being on heavier paper. The "Wall Display Map" (38" x 50" including text) is an expanded version of the same map; the larger size has provided enough room to indicate the location of every known Native language of North America, even where they are in such small areas that they could be mapped only at the family or sub-family level on the original map. This is the only published map that has located every language. Many major dialects are also included.

On both maps, 62 language families are distinguished by separate colors, making the linguistic diversity of North America strikingly evident. Areas with no surviving linguistic documentation are left white.

The maps are accompanied by a brief descriptive text and a complete classification that includes unmapped dialects and two post-contact mixed languages. The text for the smaller map is in a separate booklet. The one for the larger map is printed on the left side of the sheet and can be folded under or cut off to display only the 38" by 41" map, if desired.

The Folded Study Map (ISBN 0-8032-9269-4) lists for $14.95. The Wall Display Map (ISBN 0-8032-9271-6) is provided rolled in a sturdy mailing tube and lists for $19.95. To order from the University of Nebraska Press, call 1-800-755-1105; fax: 1-800-526-2617; outside the U.S. 402-472-3584; email: pressmail@unl.edu; web site: www.nebraskapress.unl.edu

Ives Goddard is volume editor of the Handbook of North American Indians: Volume 17: Languages, and linguist in the Smithsonian Institution's Department of Anthropology.

ANTHROPOLOGY CURRICULUM

Anthropology. 2000. Gene Boteler and Mary Boteler. The Center for Learning. 259 pp.

This curriculum is written by two former participants of the Smithsonian Institution/George Washington University Anthropology for Teachers Program who teach anthropology at the high school level. The authors have designed this spiral-bound manual as a primary teaching tool or supplementary resource.

Anthropology is organized into five parts. Part 1: "Studying the Human Story" introduces students to the study and fields of anthropology. Students conduct an anthropological study of their fellow high school students, determine what objects can tell us about culture, gain a perspective of the concept of time, and learn how natural selection works within nature.

Part 2: "Humanity's Closest Relatives" explores the origins of human physiology and behavior by focusing on the primates. Part 3: "Human Beginnings" explains how biological anthropology determines what makes us human. This section covers the fossil evidence, mitrochondrial DNA studies and migration theories, and genetics.

Part 4: "Hallmarks and Touchstones of Culture" demonstrates the variety of the human condition and explores such topics as cultural change, kinship, gender roles, marriage, economic activities, environment, warfare, and more. Part 5: "Expressions of Culture" focuses on taboos, religion, language, art, potlatch, sports, and a Yanomamo case study.

This curriculum contains 40 creative lesson plans and 80 handouts. While it is geared for grades 9-12, it easily can be adapted for lower grades. The authors have made suggestions on handling such potentially sensitive or controversial topics as evolution and religion. While this book is an excellent text for anthropology, it also would be a valuable supplement for teaching classes on biology, history, world cultures, math, social studies, and art.

Order from: The Center for Learning, PO Box 910, Villa Maria, PA 16155; (724) 964-8083, (800) 767-9090, www.centerforlearning.org. The book is listed under senior high electives on the web site.

TEACHER'S CORNER: FAMILY FOLKLORE IN THE CLASSROOM

[Editors' Note: This article, compiled by *AnthroNotes* editor Ruth O. Selig, is based on the research and writing of staff that originally developed a Family Folklore Program for the Smithsonian Institution's Folklife Festival, as well as additional materials collected in Laramie, Wyoming, for a teachers' in-service workshop taught by Selig and Laramie High School English teacher, Karen Maxfield. Many of the ideas are drawn from *A Celebration of American Family Folklore* by Steven J. Zeitlin, Amy J. Kotkin, and Holly Cutting Baker.

Recently the National Endowment for the Humanities, in partnership with the White House Millennium Council, undertook a "millennium" project called My History, an initiative that "offers all of us a way to explore family history as we discover how our own family stories connect to the history of our nation." The NEH guidebook, *My History is America's History: 15 Things You Can Do to Save America's Stories*, offers specific ways to preserve family memories and treasures through activities that make history an exciting adventure.]

Introduction

Over the last few decades, historians, sociologists, anthropologists, and folklorists have begun to focus attention on community studies, teaching us much about the varied traditions flourishing in America. Within our country we must look to the experiences of ethnic and religious groups, the lives of women and children, the history of regional and occupational groups, and even to our own family folklore to find the creative and cultural expression of the American past. "For every famous literary and photographic work, there are hundreds of thousands of stories and snapshots in which Americans have invested a large portion of their creative genius. Family tradition is one of the great repositories of American culture. It contains clues to our national character and insights into our family structure" (Zeitlin, Kotkin, and Baker, p.2).

Family folklore, then, consists of family stories, expressions, customs, traditions, and photographs that characterize a family's life. Having students collect, record, and write about their family folklore can be an exciting and meaningful way for them to connect themselves to broader American culture and history, as well as help them sharpen their skills in social studies and language arts.

How To Begin

Since family folklore consists of traditions, stories, artifacts, and photographs, each of the approaches described below can be the focus of class projects.

Holiday Analysis:

Explain to students that a family tradition is a special practice that a family reenacts in approximately the same way, day after day or year after year. A birthday celebration, Passover Seder, or Thanksgiving dinner may give rise to family traditions as may other holidays such as the Fourth of July or Labor Day.

On a chart, have students make a vertical list of all the holidays they or their families celebrate, and briefly describe in horizontal categories what traditions are associated with each. For example, students can list what foods are eaten, when and where the holiday meal is served, and who usually attends. What games, if any, are played? Are certain objects or dishes always present? Are gifts exchanged, and if so how, when, and where? Are songs sung, music played, dances danced, prayers offered, or speeches given? Is the national flag displayed? Is religious service attended?

After compiling their individual charts, students should be ready to discuss the origin of holidays and the various ways each is celebrated. It should become readily apparent that holidays originate for a variety of reasons, but that while students share some traditions with one another, other traditions are unique to each person's family. Some of this interesting variation arises from regional, ethnic, and religious background, but some of this variation also arises from family and community history. As students share their common and different experiences, a rich blending of family and cultural history should emerge, along with new understanding that both the yearly cycle and our personal lives are marked by continuing celebrations and rituals.

Interviewing Family Members:

The next project might be the recording of a student's own family history through information gained by interviewing another family member. Every interview will be different, and students should be encouraged to create their own questions. The "Interviewing Guide

and Questionnaire" offered at the end of this article should be useful in helping students conduct successful interviews.

Family Stories:
Once students have conducted interviews they will be in a good position to share and analyze their family folklore. Researchers have detailed certain recurrent themes in family folklore stories such as the "crossing over" stories recounting the migration west in covered wagons, crossing borders from one county to another, or remembering the ocean voyages ending at Ellis Island; stories of family heroes, rogues, or misfits; stories of parents' youthful antics or courtship and marriage; or stories of family misfortunes, feuds, or escape from near death. Ask students to share their stories and see if they can identify any of these or other common themes.

Planning a Family Folklore Unit:
After students have done a holiday analysis, interviewed older family members, and collected family folklore stories, a number of class projects and units are possible. Students can make a collection of photographs, objects, and recipes handed down in their families. The class may want to make an illustrated collection of particularly amusing or dramatic family stories. Photo albums can be shared, and photo-journals or scrapbooks can be created combining stories, reminiscences, family expressions, family photos, genealogy charts, and personal and family time lines marking and illustrating important family events and changes.

Through these and other projects described in the attached list, students should gain an appreciation of tradition and continuity from one generation to the next, and the value of preserving traditions, objects, and ideas from the past. Through family folklore a teacher can bring history to life and life to history, as well as help students connect their personal and family past to broader cultural and language arts study.

Family Folklore Projects

Classroom Exhibits:
Students can build classroom exhibits using posters, photographs, artifacts, and stories drawn from their own family folklore to illustrate topics such as "Western Expansion," "Immigration," "Victorian Era," "Jazz Age," or "The Depression."

Scrapbooks or Photojournals:
Scrapbooks or photojournals can be organized in a variety of ways using family trees, genealogical charts, photographs, family stories, jokes, expressions, games, nicknames, songs, etc. Much of what students learn through interviewing older family members can be included. Some students may choose to focus this project more on their own personal history if they cannot gather enough material on their larger families.

Heirlooms:
Have students find out what objects they have which are family keepsakes or heirlooms. Have them find out the history of these objects and the stories behind these family treasures. Students can then write descriptions or imaginary stories about these important and symbolic objects. How do the heirlooms connect past, present, and future? What do they reflect of the family and the larger culture? Students can make a "Class Collection" of objects which could become heirlooms for a future generation.

Crafts:
In many families hand skills are carried down through the generations. Students can try to learn a handicraft from an older member of their family or research an earlier method of production from a specific period they choose. Once the research is completed, students should try to replicate the method as closely as possible for such crafts as candle dipping, soap making, hide tanning, quilting, basket weaving, ham curing, vegetable canning, and jelly or bread making.

Calendars:
Students can make a family food calendar by interviewing parents or grandparents about their family food traditions and recipes, particularly favorite foods, traditional holiday foods, and birthday foods. Each student can then make a food calendar with a family recipe and drawing illustrating each month. On the calendar all the holidays of the year can be marked as well as any family birthdays and anniversaries.

Home Remedies:
Ask students to research how their parents and grandparents cared for a) hiccups, b) a cold or the flu, c) warts, and d) indigestion. Then students can share their "cures" in a class discussion focusing on "family folk medicine."

Names:
Students can collect information about their first, middle, and last names, as well as any family nicknames. In class discussion it should become clear that names originate in a variety of ways and that names often reflect complex family tradition, origins, and even naming fashion trends. Students can research naming ceremonies and customs from a variety of religious traditions and cultures. Finally, each student can create a personal Coat of Arms, Shield, or Name Crest illustrated with pictures symbolizing activities, values, or traditions important to their families.

Class Banquet:
Students bring in a variety of favorite family recipes, and together the class plans and prepares a "feast" made up of family foods and other traditional meal customs. Students who cannot contribute food can often contribute these customs, a prayer or recitation before the meal, or a game or song to come just after the banquet.

Guest Speakers:
Invite interested parents or grand-parents to the classroom to share their particular food or holiday customs, family stories, photo albums, or handicrafts. Invite a religious leader to discuss ceremonies and rituals which mark important "rites of passage" such as birth, marriage, and death.

Time Lines:
Ask students to make an illustrated time line of important moments in their own lives: birth, birthdays, first school, pets, hobbies, travels, new skills, etc. Then ask them to make an illustrated time line of their family's history beginning with the birth date of the oldest member of the family. The line should include important births, marriages, and deaths, but also significant events such as migrations or moves, occupational changes, educational achievements, travels, etc. Family photographs or drawings can be used for illustrations.

Local Historical Society:
Visit your local museum or historical society and have students identify connections they can see between their own family history and the history of their community as reflected in the exhibits.

Imaginary Family Folklore:
Divide the class into groups, each one responsible for creating an imaginary family folklore. Each group must 1) create an "ancestor" and a story of migration to America, 2) have a family story of a hero or rogue, 3) describe an heirloom, 4) create an unusual holiday tradition. Groups then share their "folklore."

Family Folklore to Teach Writing

1. Many descriptive and narrative writing assignments easily grow from a study of family folklore. For example, students can describe:
   a) a childhood memory, a holiday meal, a family heirloom;
   b) a scene or person in an old family photograph;
   c) the family history imagined for a person in a photograph book;
   d) an amusing family story elaborated and illustrated;
   e) a short autobiography or family history illustrated with drawings or family photographs.

2. History and research paper assignments might include:
   a) relating family history to broader political, social, or economic events by asking students to incorporate interview material into papers on such topics as the depression, women's roles in the 1950s, World War II, and the beginning of the space age;
   b) a research paper based on events during the week the student was born;
   c) a study of the 20th century, decade by decade, using old magazines and newspapers, along with family histories.

3. For any novel or short story your class is reading, students can imagine, create, and write the family folklore of a particular character.

4. Writing Proverbs:
   a) Students can write and illustrate a story explaining the proverb "If you want to know the apple, you've got to study the tree."
   b) Students can read books of proverbs to choose two or three that relate to family folklore and then use them as a basis for a story and illustration.

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c) Finally, students can try to write their own family folklore proverb.

For most of the activities and projects described in this Teacher's Corner, it is useful to have students conduct family interviews. Below is a guide adapted, with permission from the authors, from *A Family Folklore Interviewing Guide and Questionnaire* by Holly Cutting Baker, Amy Kotkin, and Margaret Yocom, 1978.

Interviewing Guide

A word of Warning:
Because family folklore exists only within the context of a living family, it is constantly evolving. Each generation will forget or alter the lore that it has received, but that same generation will add new verbal lore and new traditions. A tradition does not have to be old to be worth recording. Collecting family folklore is one case in which too much is better than too little. Tapes can be edited and transcripts can be discarded, but the tradition, story, or expression that you neglect to record today may exist only in memory next week. No one can record all of a family's folklore.

Equipment:
Note-taking and tape recording are the usual means of recording family folklore. Both methods have advantages and disadvantages. When a choice is possible, you should use whichever will work best for your interview.

Note-taking can be distracting and make it difficult to participate in the conversation or activities involved with the interview. Also, the expressions of the voice of the informant are lost. A tape recorder may at first make the participants uneasy but they will soon become accustomed to its presence. A small cassette machine with a built-in, omni-directional microphone will give the best results. A ninety-minute cassette is a good choice since it will record substantial segments of an interview without interruption. The microphone should be placed so that all voices, including yours, can be picked up. Run a test before you begin the actual interview and adjust the machine accordingly. As far as possible, all extraneous noise should be eliminated.

Although not as essential as a tape recorder, a camera is a useful piece of equipment. Besides providing a visual record of the participants, it can also be used to copy any documentary records that your informant might offer such as photographs or scrapbooks.

People to Interview:
Start with yourself. You will know a great deal about your family history. Questions you come up with will give you guidelines for how to interview other people.

The first outside person you interview should be someone with whom you feel very comfortable. A parent or sibling is a good choice. Don't neglect non-relatives. Your grandfather's best friend might tell you things about him no family member knows. Each interview will give you clues about whom you might interview next.

Place:
A spontaneous, natural context is the best to bring about the flow of memories--family dinners, talking with grandma while doing the dishes or cleaning out closets. If possible, plan to hold your interview while doing a familiar kind of activity like walking, baking, or visiting -- anything that might naturally bring up memories. You might use an heirloom or photographs to help move the interview along.

Ethics:
Because of the personal nature of folklore, students must be careful to protect the privacy and rights of all family members. Before initiating a unit in family folklore, it is a good idea to explain the class project to your students' families. Assure all involved that students will interview only willing family members. Explain the purpose of the unit; for example, that the class is studying family folklore as part of their study of American history and that students will learn about writing, analyzing, and reporting information gathered through research and interviews. Before any interview, students should explain to the person being interviewed the purpose of the research.

Planning an Interview:
Spontaneous interviews will have to be handled as they happen. However, if possible, students should plan their interviews. It is even possible to supply informants with questions ahead of time. Questions should be developed so that one follows another logically. A few well-prepared questions will work better than many poorly prepared ones.

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1. Well-prepared questions are:
   a. concise, to the point, and not ambiguous.
   b. free of emotionally charged words. Be as objective as possible; avoid asking a question to get a specific response.

2. Helpful hints in formulating questions:
   a. to get at facts, ask what? when? who?
   b. to get at ideas or descriptions of relationships, ask how? why?
   c. to get at analysis or critical thinking, use the words: please explain, can I have a reason for that, can you account for, what is the importance of, tell me why you agree or disagree, give illustrations for, how do you explain?
   d. to get an evaluation or provoke further thought, try asking: explain, show me, clarify, how would you evaluate?
   e. to get description, use the words: tell me, discuss, describe, illustrate, paint a word picture.

3. Realize there will be some information you will not be able to get. There may be sensitive material people do not want to discuss.

4. Be as low key as possible. Realize that you may be seen more as an interrogator than a son, daughter, or friend during the interview.

5. Show interest. Take an active part in the conversation without dominating it. Be a good listener.

6. Know what questions you want to ask, but don't be afraid to let your informant go off on a tangent. He or she may touch on important subjects you did not think to ask about.

7. Never turn off the tape recorder unless you are asked to. Not only does it break the conversation, such action suggests that you think some of your informant's material is not worth recording.

8. Use props whenever possible. Documents, letters, photo albums, scrapbooks, home movies, and other family heirlooms can be profitably used to stimulate memories.

9. Be sensitive to the needs of family members. Schedule your sessions at convenient times. Older people tire easily; cut the interview off at the first sign of fatigue. Don't slight family members who show interest in your project. Interview them even if you have reason to believe their material will be of minimal value.

10. If possible, prepare some kind of written report for the family members you interview as a tangible result of their participation. Remember to save all your tapes, notes, and other documentation that you accumulated. Label everything with names, dates, and places.

A Possible Questionnaire

Every interview will be different, and students should be encouraged to formulate their own questions. Every family is unique, and every interviewer has his own interests and style. Thus no single set of questions will elicit all possible family folklore from all families. The most useful questions will be those developed through a person's own knowledge of his/her own family. However, the list below may be helpful and suggestive to students first embarking on family folklore interviewing.

Suggested Questions:

1. What do you know about your family's last name? Its origin? Its meaning? Did it change when your relatives first came to America? If it changed, what was it before and why was it changed? Are there any traditional first names, middle names, or nicknames in your family? How did they get started? When your parents married, did your mother keep her own last name? What does her last name mean? What is its history? How did your parents choose your name? What will you name your children?

2. What stories have come down to you about your grandparents or parents? For example, what do you know of their childhood, schooling, marriages, occupations, political activity, religious affiliation, hobbies? How many different occupations can you name from your family? Are there any special talents or hobbies which have come down in the family such as playing a musical instrument, needlework, painting?

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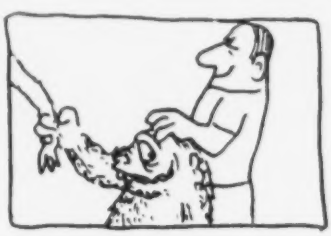
3. How did your parents, grandparents, or other relatives come to meet and marry? Are there any family stories of lost loves, jilted brides, unusual courtships, arranged marriages, elopements, runaway lovers?

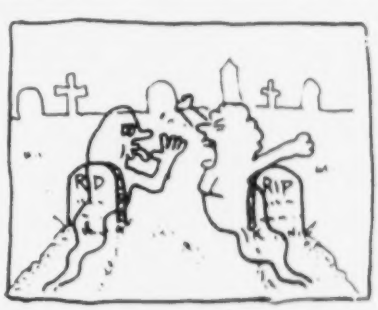
4. Ask some of your older relatives what they studied when they went to school. What did they dream of becoming when they grew up? What happened in their lives which made those dreams possible or impossible to fulfill? Where have they traveled? What unusual people have they met in their lives? What are the most important things they've learned in their lives?

5. What other people (friends, household workers, children) have been adopted into your family? Are they called cousins, aunts, etc.?



6. What important holidays are celebrated in the family and how? What are the different ways family members have celebrated national, religious, or family holidays? What are the traditional meals, decorations, and ritual customs associated with these occasions? What innovations have entered your family's holiday celebrations? Has your family ever created an entirely new holiday?

7. Is there a family cemetery or burial plot? Who is buried with whom? Who makes burial place decisions? What kind of information is recorded on the gravestones or grave markers? [See "Exploring Historic Cemeteries by Ann Palkovich in the Winter 1998 issue of *AnthroNotes*.]



8. Are there any family stories about mysterious, eccentric, notorious, or infamous characters in the family? Any family heroes from the past? What stories have been handed down about these special people? Do you think the infamy or fame of the ancestor has grown through time?

9. Have any historical events affected your family? For example, how did the family survive the Depression? How have past wars affected the family?

10. Does your family have any heirlooms, paintings of famous ancestors, objects of sentimental or monetary value which have been handed down? Are there stories connected to them? Do you know their origin or line of passage through the generations? Are there special tools that have been handed down? Does anyone use them today?

11. Does your family have photo albums, scrapbooks, slides, home movies? Do you know all the family members in these pictures? What can you find out about relatives who died before you were born? Whose responsibility in the family is the upkeep of the diaries, albums, etc.? When are they shared or displayed? Are they specially arranged, edited, designed?

12. Does the family hold reunions? When, where, and how often? Who organizes the reunion, and who comes? What occurs during the reunion and is a record kept?

13. Does the family have any special recipes that have been preserved in the family from past generations? Are there any stories connected to them?

14. Does the family have any unique expressions, folk sayings, or home remedies that have been passed down through the generations?

Basic Family Folklore Resources

Cook, Ann, Marilyn Gittell, and Herb Mark. 1976. *What Was it like When Your Grandparents Were Your Age?* Pantheon Books. (Text and numerous photographs depict life in the United States in the 1920s and 1930s.)

Dixon, Janet T. and Dora Flack. 1977. *Preserving Your Past: a Painless Guide to Writing Your Autobiography and Family History.* Doubleday and Co. (A how-to-do-it family history book with suggestions for the creative writing aspects of doing family history.)

The National Endowment for the Humanities. 1999. *My History is America's History: 15 Things You Can Do to Save America's Stories.* In partnership with the White House Millennium Council. (The guidebook includes 15 activity chapters; for example, "Playing Detective with Photographs," "Discovering Clues in Family Papers," "Uncovering History in the Attic," as well as a large section on ways to preserve family treasures and an excellent Resources Section.) For further information, visit the website: www.myhistory.org.

Zeitlin, Steven J., Amy Kotkin, and Holly Cutting Baker. *A Celebration of American Family Folklore.* Pantheon Books, 1982.

ARCHAEOLOGY SYMPOSIUM FOR TEACHERS

"Teaching the Past Through Archaeology" is a two-day symposium organized by the Smithsonian's Department of Anthropology and the Society for American Archaeology Public Education Committee, which will be held September 22 & 23, 2000 at the Smithsonian Institution.

Through a combination of lectures and workshops, teachers will learn exciting and creative ways of introducing archaeology into various social science and science curricula such as geography, history, social studies, and biology, as well as the importance of preserving our cultural heritage.

Lectures will cover the following topics: The Impact of El Niño on Prehistoric Populations in Amazonia; Bones Tell Tales: Searching for the Earliest Americans from Human Remains; The Vikings in the New World; Unveiling the African American Past; and Ancient Diseases, Ancient Civilizations.

The four workshops from which teachers will choose three are: Intrigue of the Past; The Uluburun Shipwreck Project: Interconnections Through Trade in the Late Bronze Age Mediterranean World; World Trees and Tree Stones: Classroom Lessons on Maya Archaeology; and Teaching with Historic Places.

The symposium will also include a panel presentation that will focus on archaeological resources, Internet communications, and ways to incorporate archaeology into the curriculum. The second day will conclude with a discussion period followed by a reception at the Smithsonian Castle.

The registration fee is $75.00. To receive a program and an application form, contact: Ann Kaupp, Department of Anthropology, Smithsonian Institution, Washington, D.C. 20560-0112; (202) 357-1592; fax: (202) 357-2208; email: kaupp.ann@nmnh.si.edu.

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AnthroNotes offers in-depth articles on current anthropological research, teaching activities, reviews of new resources, and summer fieldwork opportunities. *AnthroNotes* was originally part of the George Washington University/Smithsonian Institution Anthropology for Teachers Program funded by the National Science Foundation. It is published free-of-charge in the fall and spring.

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ANTHRONOTES **has a three part mission:**

1. To more widely disseminate original, recent research in anthropology in order to help readers stay current in the field;
2. To help those teaching anthropology utilize new materials, approaches, and community resources, as well as integrate anthropology into a wide variety of subjects; and
3. To create a national network of anthropologists, archaeologists, teachers, museum and other professionals interested in the wider dissemination of anthropology, particularly in schools.

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